ELECTRICAL WEST

December 1947
25 cents

Something New in Stores, Page 55
Appliances, Page 84

ESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

Part & Parcel

Every electrical appliance sold for use in Edison territory becomes *our* business. So there's good reason for our interest in the welfare of Southern California appliance dealers.

New and improved electrical appliances are bringing to Edison customers the comforts and conveniences of modern living. More and more homeowners are enjoying new freedom from household tasks, and new pleasures provided electrically.

Edison's place in the picture is to provide an adequate and uninterrupted supply of power, so customers can enjoy these benefits to the fullest. Their satisfaction is important to us, too.

That's why Edison tells them, and the dealer sells them. The appliance dealer's counter, which is the point of sale, is part and parcel of every Edison advertisement. With the accent on the parcel, of course!

SOUTHERN CALIFORNIA EDISON COMPANY

PRIMARY FUSE CUTOUTS

for all service requirements

Compare each with its field for reliability, performance and flexibility of application!

INDICATING—DROP-OUT—RECLOSING

Interchangeable doors make these enclosed cutouts the most versatile in their field. *Three interchangeable doors*—indicating and drop-out, two-element reclosing, and disconnect—available for each current rating; *fit both the 5-kv and the 7.5-kv housings*. Just five major stock parts, for both 50- and 100-ampere ratings, fill all your requirements. Bulletin GEA-3448-B tells the complete story.

NON-INDICATING

These cutouts, lowest in price of all wet-process porcelain-enclosed cutouts, enable appreciable savings where indication is not necessary.

With exceptionally liberal design of contact areas and interlocking barriers, these cutouts are tops in the non-indicating field.

More than a million and a half in service have proved their high mechanical and electrical strength, and overall durability. Bulletin GEA-2390-C gives complete information.

OPEN-TYPE, DROP-OUT

This is the first "bird-proof" cutout in the open-type drop-out field. The mounting support is cemented into the one-piece solid insulator in the *opposite side* from all live parts—minimizing possibility of bird or animal blowing a fuse by touching a live part and the mounting at the same time. Note the closely coupled fuseholder which can be removed or replaced easily with standard switch stick.

FLIP-OPEN

A low-cost cutout for primary fusing of rural lines where possible short-circuit current is limited. Like the open-type drop-out cutout the Flip-open cutout is virtually "bird-proof." Double-wedge silver-plated contacts grip the fuse link cable. Helical-wound springs retard vibration stresses on fuse link. Like all G-E cutouts, the mounting support is cemented into the porcelain insulator for exceptional strength and durability. Bulletin GEA-4224-A gives details.

General Electric also has a complete line of oil fuse cutouts, secondary cutouts and fuses, and universal conventional and Hi-surge fuse links.
Apparatus Department, General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC

406-22

DECEMBER 1947

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixtieth year of publication.

ELECTRICAL WEST

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IN OUR NEXT

Housing isn't the only thing that is crowded these days, and many a time this page has promised something the editors fully intended to let you have in the next issue but in those last hours of jigsawing all the parts of an issue together somehow there was a piece or two too many. That is what happened to the promised "Grade Labeling of Employees Can Backfire" which is set in type and we hope can come into your view next time. More of the valuable papers briefed at the IES conferences, too, will be run; there just were not enough pages this time. PCEA'S big fall conference at Fresno promises to bring forth much interesting and usable thinking which the staff will endeavor to bring you in January. Contractors should find beneficial the material presented at one of C. A. Langlais' foremen's meetings, as a follow up to the article in this issue. There are many new and interesting lighting jobs to picture, the new things in the construction and engineering field to report pictorially, and some mighty pertinent sales and merchandising views for dealers who wish to tackle the New Year with a good grip on the reins of their business. All in all, whatever your field in the electrical industry, there will be something for you.

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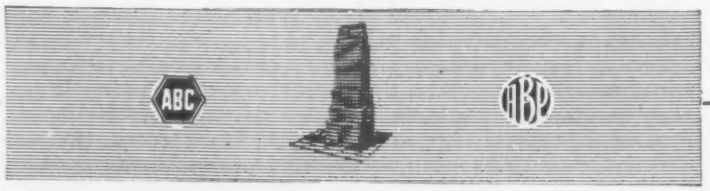

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These L-M Power Fuse Cutouts

handle 7.5 to 46 Kv. . . . 100 and 200 ampere ratings

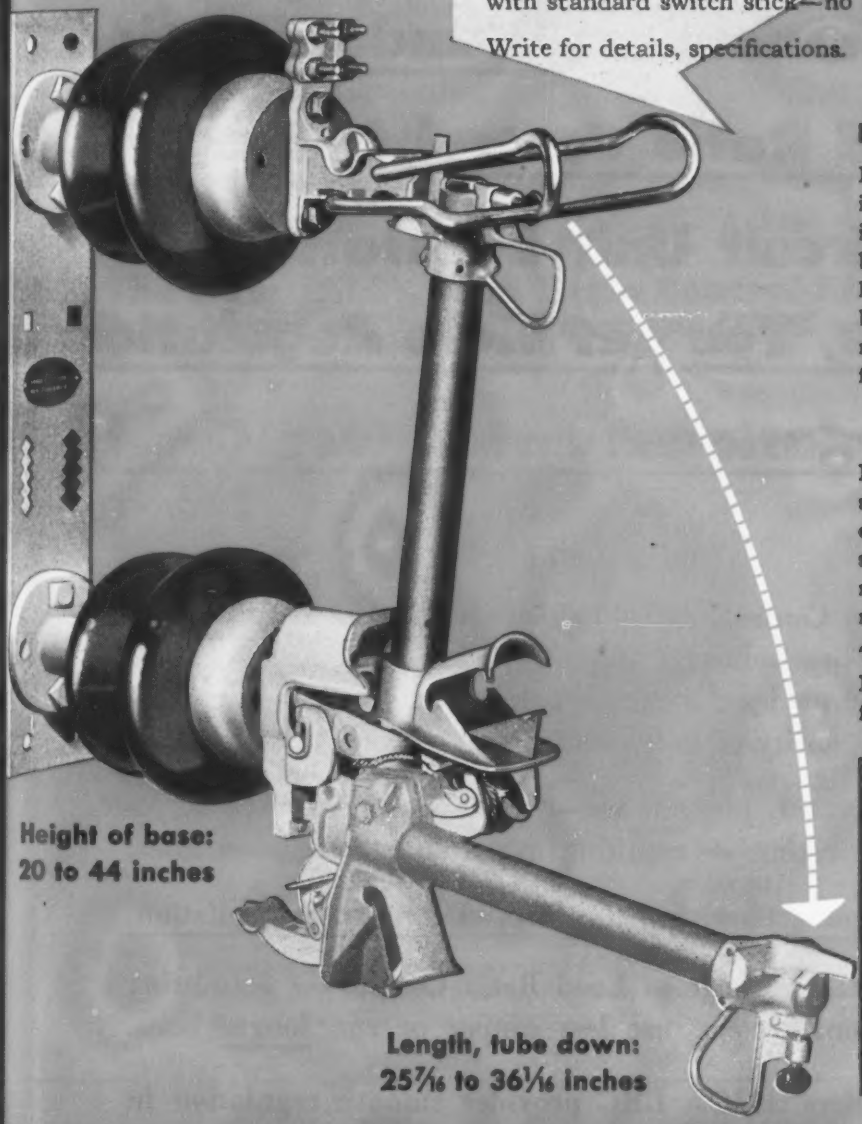
with interrupting capacities up to 6000 amperes

For heavy currents at or near substations . . . for transmission lines . . . wherever high voltage, high rupturing capacity cutouts are required.

A fuse cutout using standard field replaceable fuse links. Upper and lower venting. Simple, positive operation. Link flip-out release double lower hinge. No excessive strain on link. Unique wire spring contact design provides firm contact, free floating action with positive latch at top of tube. No shunts or other current transfer means. For re-fusing, cartridge can be lifted off hinge with standard switch stick—no tongs or special sticks needed.

Write for details, specifications. Line Material Company, Milwaukee 1, Wis.

Length, tube up:
20¾ to 31½ inches



Height of base:
20 to 44 inches

Length, tube down:
25 7/16 to 36 1/16 inches

L-M Replaceable Power Fuse Links

Field replaceable standard links similar in design and construction to types used in distribution cutouts. No cartridge to buy, no filler tubes to bother with. Links have tin fusible element; strain wire; butt-soldered to top button and lower rod terminal. Long fibre tube housing from button to flexible leader.

Cutaway view of 200 ampere link

Double-Venting Feature

Button closes top of cutout tube. Side spring contacts permit button to blow off under heavy shorts, releasing pressure at both ends of tube. Eliminates recoil and stresses on contacts and mountings.

Time current characteristics conform to NEMA "E" standard SG-11 for power fuse links.

RUPTURING CAPACITIES		
Voltage	Type HFO 100-amp rating	Type HXO 200-amp rating
7500 volts	4000 amps	6000 amps
15000	4000	6000
23000	4000	6000
34500	2000	4000
46000	2000	4000

LINE MATERIAL
FUSE CUTOUTS & FUSE LINKS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

AN IMPORTANT

to Electric

Allis-Chalmers Announces Standardization on ± 10% Load Ratio Control in Single and Multi-Circuit Unit Substations!

Effective at Once, You get More Regulation . . . Better Regulation . . . at Lower Cost!

★ A Pioneer in Load Ratio Control, Allis-Chalmers has always kept close to the needs of the Electric Utility Industry. Experience has proven that ± 10% LRC in thirty-two ⅝% steps provides the narrow band width and wide range of regulation required by the majority of unit substation applications.

★ Now, with only one standard, just one set of electrical designs will be required for each transformer rating — resulting in manufacturing economies.

★ These savings are now going to you in the form of lower cost regulation.

★ This means an additional 5% range of Load Ratio Control — permitting you to put more load on your system, use less copper or run longer lines.

★ And because Allis-Chalmers ± 10% LRC provides smooth regulation in thirty-two ⅝% steps you can hold voltage to ± 1 volt.

★ Standard ± 10% LRC unit substations will operate in parallel with all existing LRC unit substations as well as with existing standard feeder voltage regulators.

ANNOUNCEMENT

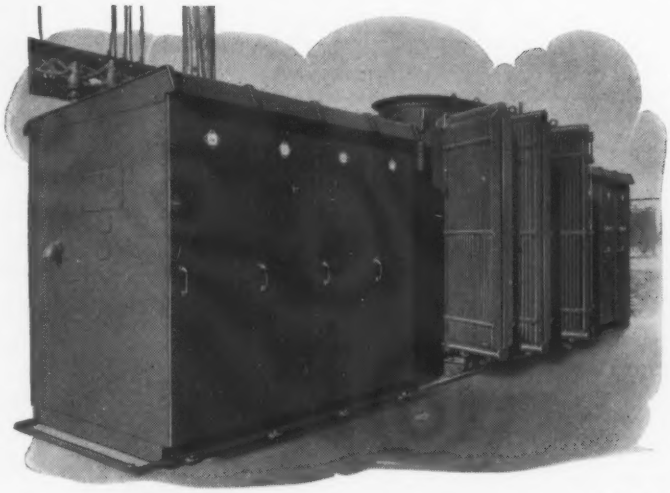
Utilities . . .

★ To sum up, under the new A-C unit substation standard you will get:

1) A "bonus" of 5% more range of regulation!
2) *Finer* thirty-two 5/8% step regulation!
3) Narrower band widths!
4) Increased system capacity!

A representative in our nearby district office will be glad to amplify for you the savings possible in this new standard. ALLIS-CHALMERS, MILWAUKEE.

The New ± 10% Load Ratio Control Standard Applies to Both types of Unit Substations Used by Electric Utilities—



MCS —Allis-Chalmers multi-circuit unit substation. Consists of two or more vertical lift metal-clad switchgear units, throat-connected to 1 or 2 transformers.

SCS— Allis-Chalmers single-circuit unit substation. Consists of transformer, one secondary breaker and controls, combined within a single housing. Move and install as a unit.

A 2358

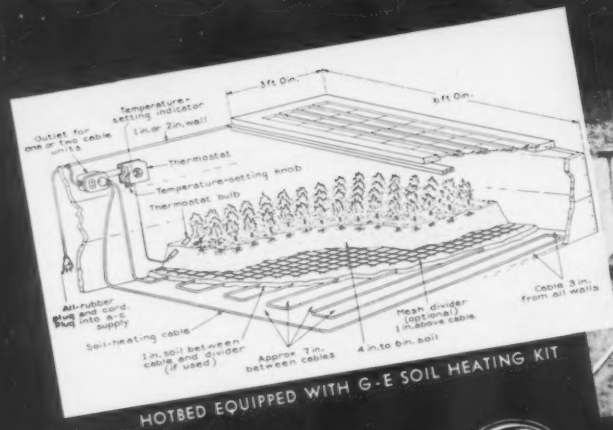
ALLIS-CHALMERS

"Originators of 5/8% Step Regulation!"

G-E SOIL HEATING CABLE READY FOR COVERING WITH SOIL

COMPARATIVE GROWTH OF CELERY AFTER 26 DAYS

SOIL HEATING


Temperature-setting indicator
Outlet for one or two cable units
1 in. or 2 in. wall
3 ft. 0 in.
6 ft. 0 in.
Thermostat
Temperature-setting knob
Thermostat bulb
All-rubber plug and cord into a-c supply
Soil-heating cable
1 in. soil between cable and divider (if used)
Approx. 2 in. between cables
Mesh divider (optional) 1 in. above cable
4 in. to 6 in. soil
Cable 3 in. from all walls

HOTBED EQUIPPED WITH G-E SOIL HEATING KIT

OUTSIDE HOTBED BEFORE COVERING WITH SOIL

SOIL HEATING UNITS and HEATING CABLE

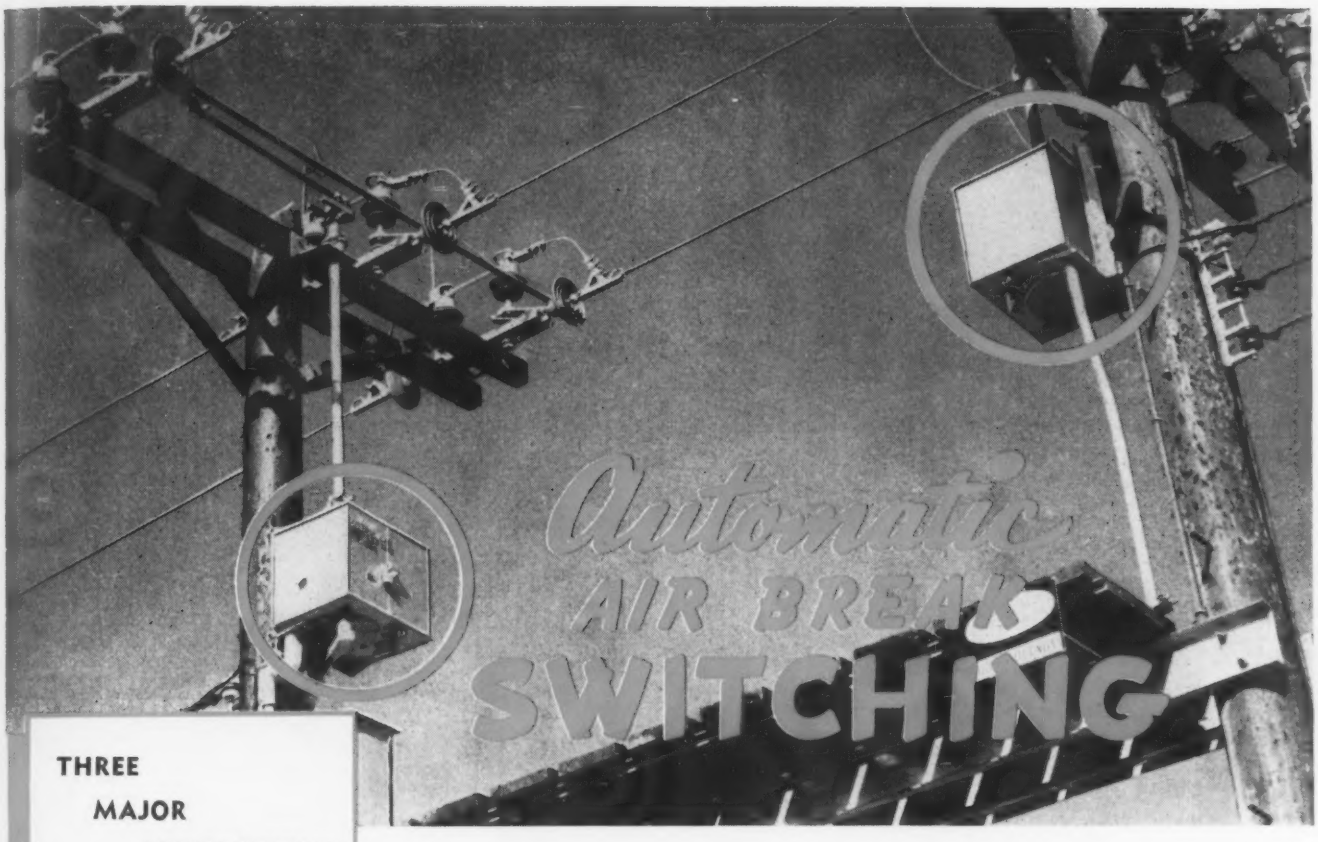
Over a period of years, large market gardeners, farmers, and commercial florists have purchased and used thousands of G-E soil-heating units because of the protection of uniform temperatures. They know that automatic temperature control means protection to plants, savings in labor and power, and assurance of uniform operation night and day. The special, flexible heating cable is also adaptable for use wherever controlled temperatures are desirable, such as in melting ice, protecting pipes, and keeping brooders at even temperatures.

The soil-heating kit is a complete and automatic electric soil heater, requiring no special wiring on 115 or 230 volts, no interconnections, just a simple outlet.

CALL OR WRITE FOR DETAILED INFORMATION

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE



THREE MAJOR APPLICATIONS

- **LOAD TRANSFER**
- **TROUBLE ISOLATION**
- **LINE SECTIONALIZING**

Plus: **COMPLETE CONSTANT CONTROL**

Automatic air break switches open a broad field for improvement of customer service at relatively low cost. For industrial or commercial customers, who can't afford power interruptions, a load may be transferred instantaneously or, after a predetermined time delay, from a preferred to an emergency source, and then back to the preferred source upon restoration of potential.

Southern States' automatic air break switches are also available for such applications as the automatic isolation of faulted branch line, automatic sectionalizing of loop transmission and distribution circuits, and automatic sectionalizing of radial feeders. Switching equipment is also available for remote control by an operator.

Through the use of Southern States' motor—or spring—operated machinisms, or **a combination of both in the same cabinet,** reliable, **automatic** air break switch operation is assured.

The designing of any scheme of automatic air break switching to the best advantage requires complete knowledge of the problem. Southern States' engineers are well-versed in such design work and are well prepared to solve your particular problem. The know-how of field experienced men goes into every layout, and the workmanship and skill of highly trained production men goes into every piece of equipment manufactured.

Send us your switching problem today and let us make a recommendation for its solution.

Address your inquiry to Box 473.

Southern States Equipment Corp.

HOME OFFICE AND FACTORY — HAMPTON, GEORGIA

REPRESENTATIVES IN FOLLOWING CITIES:

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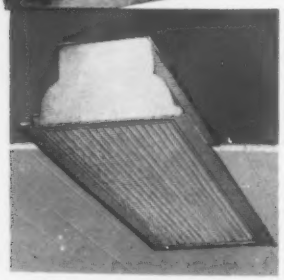
DALLAS, TEXAS
HOUSTON, TEXAS
LUBBOCK, TEXAS
SALT LAKE CITY, UTAH
SEATTLE, WASHINGTON
MILWAUKEE, WISCONSIN

LIGHTING BY *Leader*

LEADER OFFICER — VL-440. America's most beautiful commercial fluorescent fixture. High gloss white enamel louvers give soft diffusion of light.



LEADER TROFFERLITE—TG-240. An ideal fixture for use in remodeling or where a streamlined, modern effect is desired. Strong, rigid construction permits ceiling to be hung from unit.

"Ten Strike" for recreation

To those who cater to sports-loving America, good lighting has become a "must." They have proved to their own satisfaction that good lighting, fluorescent lighting by Leader, pays big dividends.

For bowling alleys, billiard parlors, or similar businesses that cater to public patronage, fluorescent lighting by Leader can do much to attract customers and to make their activities more enjoyable.

For home installations, too, such as basement or attic rumpus or game rooms, Leader fluorescent fixtures will add much to their charm and utility. For better lighting for better sports . . . Look to Leader.

Only better electrical wholesalers and contractors distribute and install Leader fixtures.

"A STEP AHEAD" LEADER ELECTRIC COMPANY

LEADER ELECTRIC COMPANY

3500 N. KEDZIE • CHICAGO 18, ILLINOIS

WEST COAST FACTORY • 2040 LIVINGSTON ST., OAKLAND 6, CALIF.

WEIGH THESE ADVANTAGES OF HAZARD Type RH ALUMINUM BUILDING WIRE

EVEN though Type RH Performite heat-resisting insulation – standard for Hazard Aluminum Building Wire – is superior to Type R Code-Grade insulation, so widely used on copper conductors, its higher cost is more than offset by the low cost of the aluminum, which goes three times as far as copper on a weight basis. Further savings can be made in handling and installation costs, too, because coils and loaded reels weigh less, and wire requires less pulling effort.

PROVED IN SERVICE – More than 1½ million miles of aluminum electrical transmission cable have been installed in a period of over half a century. Bare aluminum conductors have thus been proved in service under all kinds of exposure on overhead lines. Some installations of insulated aluminum conductors have been in use for nearly as long. Insulated aluminum conductors are being used not only for building wire but also for underground, bore hole, aerial and entrance cables.

FULLY APPROVED – For many years the National Electrical Code has permitted the use of aluminum for electrical conductors. The Underwriters' Laboratories, Inc. have approved the use of aluminum conductors subject to acceptance by local inspection authorities. U. L. approval labels are affixed to all Hazard Performite Type RH building wire containing aluminum conductors.

PROMPT SHIPMENT – Hazard Performite Type RH Aluminum Building Wire is carried in factory stock – and by many wholesalers – for immediate shipment, in sizes 6 Awg to 750,000 CM. Other sizes and cable designs can be fabricated in as little as 4 to 6 weeks. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

Write for Bulletin H-407-AL which contains tables, calculating data and details of simple splicing and terminating methods.

HAZARD

insulated wires and cables for every electrical use

5293

KEARNEY
ALUMINUM
FULL-VU
GUY GUARDS
Stay Bright—Reflect More Light

For the first time—a complete line of half-round or full-round tapered aluminum guy guards in seven and eight foot lengths!

One-third the weight of and equal in strength to galvanized steel guards.

The aluminum alloy used in these guards was selected for its strength and for its quality of retaining a bright finish. Night or day, it is safer for the public, because it reflects many times more light than galvanized steel. It is particularly suited to installations in soft coal atmospheres where galvanized steel is so quickly corroded.

Kearney Full-Vu 16 gauge Aluminum guards cost no more than comparable steel guards.

LIGHT METER TEST

From the standpoint of public safety, it is important to have guy guards reflect as much light as possible. To determine the relative light reflecting properties of Kearney Aluminum Guards, Weston Light meter measurements were taken on a heavily overcast day. The galvanized and aluminum guards had been installed for about two years. The Kearney guard showed 58% more light reflected. Compared to another galvanized guard that had been in service for about six years, the Kearney guard reflected 103% more light.

Order Now for Immediate Delivery

For Better Results Specify

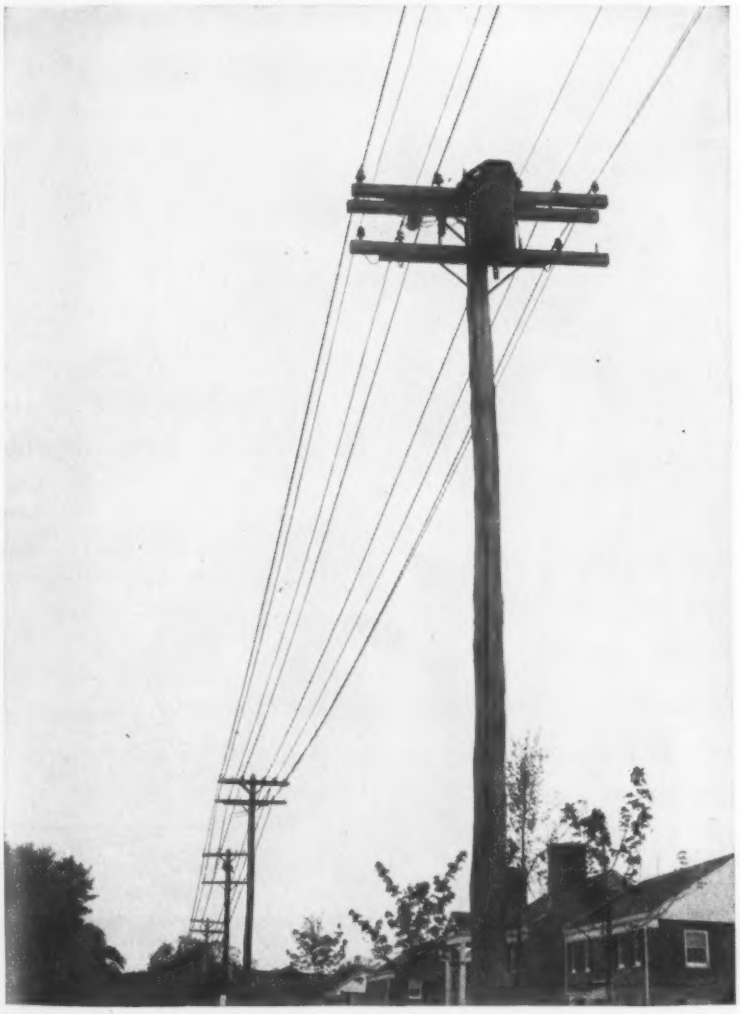
Kearney Products

101

MAYDWELL & HARTZELL
INCORPORATED
LOS ANGELES • SAN FRANCISCO • PORTLAND • SEATTLE

No more Scarecrows *in the sky*

URC WEATHERPROOFING HAS ENDED FESTOONING



Going . . . going . . . the familiar but unwelcome sight of festooning wire is destined to disappear. URC Weatherproof has licked the problem. Intensive research . . . the development of superior saturants and finishers . . . exhaustive weather tests have resulted in weatherproof that lasts longer—won't come apart and festoon. Specify *Anaconda* URC Weatherproof. 47437

For continuity of service —Anaconda DURALINE or TRIPLE BRAID URC.

The resistance to flow and the stability of URC saturants and finishers, together with improved manufacturing techniques, mean longer life to weatherproof. URC Weatherproof has ended festooning.

LOOK TO *Anaconda* FOR WEATHERPROOF THAT LASTS! ANACONDA

BRACE YOUR LINES Against Critical Strains of Winter Loads

★ STRENGTH WITHO ADDED WEIGHT

★ TREATED TO RESIS CORROSION

★ WEATHER-TESTED TIME-PROVEN

With Hubbard Ribbed Cross Arm Braces

Winter storms impose critical strains on pole lines. High winds, heavy snows and torrential rains vent their destructive forces, where least expected. To maintain uninterrupted service and relieve patrol crews from exhausting work, particularly in isolated areas, install Hubbard *Ribbed* Cross Arm braces, today. Special center ribbing of Hubbard Cross Arm braces, provides greater structural rigidity and strength without adding weight. Full weather protection is afforded by Hubbard's metal pore-sealing process of Hot-Dip galvanizing. Flat ends and rounded corners facilitate installation and avoid possibility of injury to linemen. Adopt Hubbard *Ribbed* Cross Arm Braces for years of year 'round safety and protection. Order today, or write for full details.

HUBBARD Pole Line Hardware Includes:

- ★ Standard Pole Line Hardware
- ★ Cable Material for Overhead and Underground Construction
- ★ Communication System Hardware
- ★ Electric Railway Hardware
- ★ Street Lighting Equipment
- ★ Rural Electrification Material

HUBBARD

Hubbard and COMPANY

OAKLAND, CAL. PITTSBURGH CHICAGO

HUBBARD

HANG THE LOAD ON HUBBARD HARDWARE

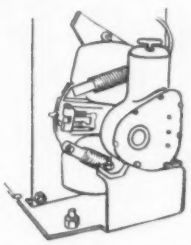
*DFR Regulator Control Holds ±1 Volt Band and is the SIMPLEST!

*DFR CONTROLS ARE EASY-TO-SET, ACCESSIBLE DUE TO UNIQUE UNIT CONSTRUCTION!

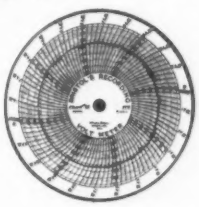
IN ADDITION TO maintaining a narrow ± 1 volt band width, the automatic control of the DFR regulator is the simplest of any regulator. With Allis-Chalmers unique unit control construction, the entire control is mounted on a single hinged chassis with a "dead front" panel. Controls are accessible . . . understandable. Relay setting is simplified because troublesome compounding or holding coils are eliminated. Elimination of these parts is possible because only micro energy is handled by relay contacts. And that's not all!

The DFR regulator requires only 8% excitation compared with the 25% excitation required by conventional regulators. High exciting current is important to you in terms of cost of equipment used for unnecessary excitation of regulators . . . in terms of installed capacitors . . . at $10 per kva . . . needed to balance high exciting current.

For further details on how you can get this simple, close voltage control, call your nearby A-C office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2338



An oil-immersed, rugged, self centering, shock absorbing, quick-break mechanism is used.

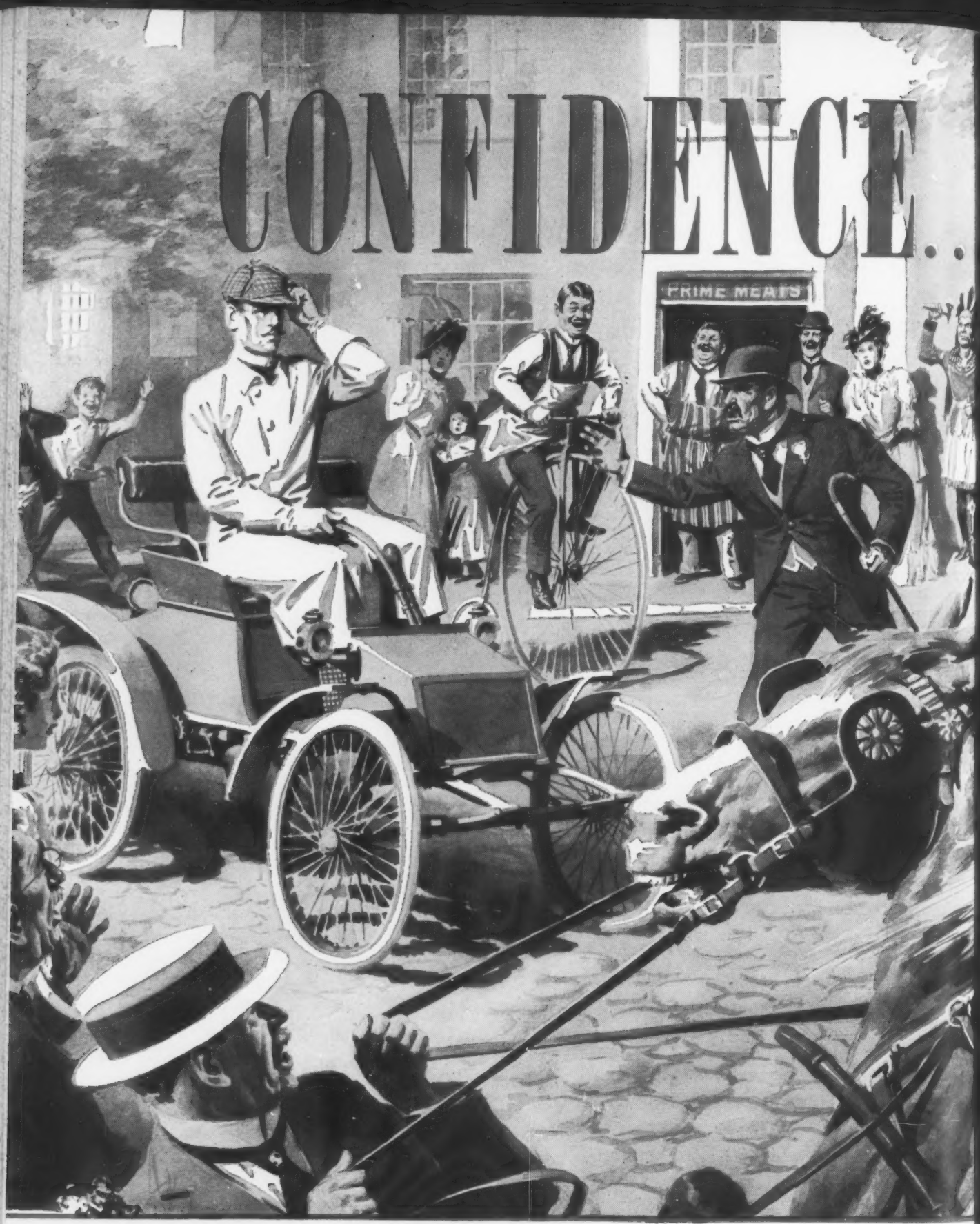


Narrow band widths due to automatic "Feather Touch" control and full voltage integration.

DFR — the only station type step regulator you can buy for single phase duty. Sizes up to 6900 v, 250 kva. AFR — for 3 phase regulation.

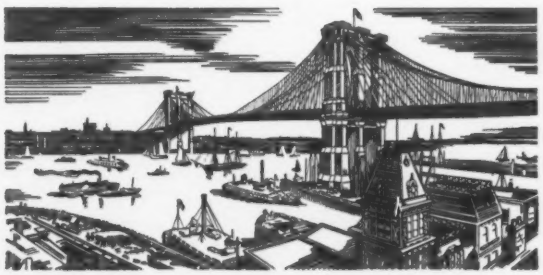
ALLIS-CHALMERS

"Originators of the 5/8% Step Regulator!"



Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems
Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts

.....how much is it worth?



IT WAS NINE YEARS before the first gasoline-driven automobile in the United States was operated by C. E. Duryea that the Brooklyn Bridge was opened in 1883. This fabulous engineering achievement was the culmination of over 26 years of planning and building, of bold vision and heart-breaking struggle, by John A. Roebling and his son Washington.

But the steadfast confidence of father and son in the success of their amazing venture is vindicated daily by the modern traffic this world-famous bridge continues to carry now . . . 64 years later.

How much is that confidence worth to you today . . . and to the John A. Roebling's Sons Company, now embarked on a multi-million dollar expansion program to meet the future's challenge?

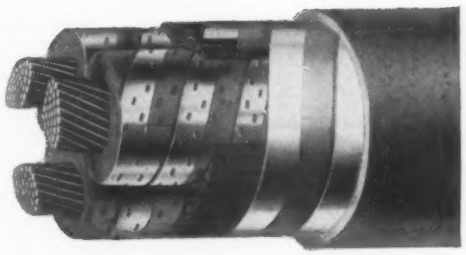
Confidence is the driving power behind our efforts to make better products do better work for you.

FOR SIMPLER INSTALLATION AND MAINTENANCE

—Roebling Paper Insulated Cables

Keep this in mind when you specify power cables: the modern "solid" type underground cable provides a simplicity of installation, an ease in maintenance care that you'll find in no other cable types designed for the same purpose.

An example is Roebling Impregnated Paper Insulated Cable, of which the Shielded Type H illustrated is especially favored for 3-Phase grounded neutral circuits at from 13 to 33 kv. Low ionization, elimination of dangerous tangential stresses, increased current carrying capacity, simplified protective devices, and smaller over-all diameter for a given voltage...these are some advantages of the shielded construction in this "solid" type typically dependable Roebling cable.



The new Roebling book "Electrical Wires and Cables" is filled with facts, figures and features on construction of wire and cable. Send for your free copy today.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

Electrical Wire and Cable • Suspension Bridges and Cables
Aircord, Aircord Terminals and Air Controls • Lawn Mowers

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A CENTURY OF CONFIDENCE

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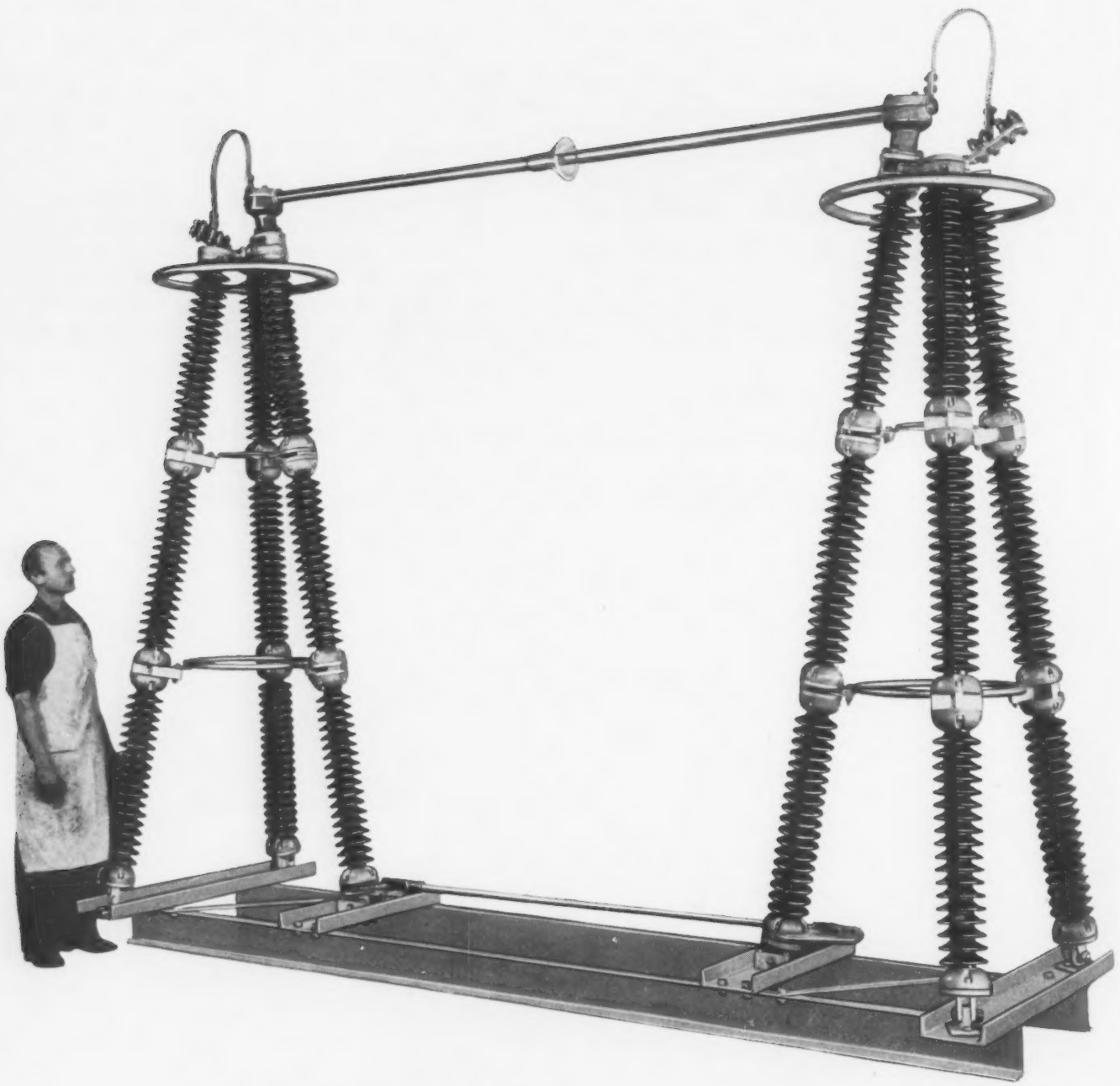
Cole Electric Co.

8439 Steller Drive TExas 0-3243 Culver City, Calif.

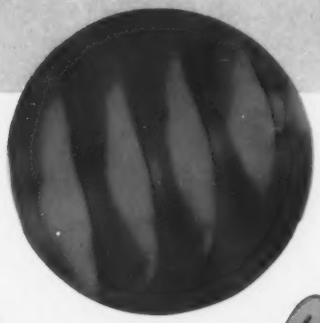


OUTDOOR DISCONNECTING SWITCH
230,000 Volts 1200 Ampere Type MU
Three Pole, Single Throw
Group Operated

(1 pole shown)

ITS THICK COPPER COVERING IS ALSO

Ductile



THERE'S NO DANGER OF CRACKING, FLAKING OR PEELING

IT'S Copperweld

For long-lasting guys and messengers, you can't beat reliable, time-tested Copperweld Strand.

This rugged strand, made of wire produced by molten-welding a heavy, permanent copper covering to a core of strong alloy steel, takes field punishment — can be bent, served, moused or clamped. The natural ductility of copper and the strength of the molten-weld eliminate danger of cracking, flaking or peeling. Since Copperweld Strand won't rust it always retains its original high strength.

Copperweld has proved its value along thousands of miles of lines — supporting millions of dollars worth of cable and guying countless poles and towers. You can rid yourself of guy and messenger worries by specifying Copperweld Strand for all your jobs.

Write for Engineering Data

COPPERWELD STEEL COMPANY • Glassport, Pa.

SALES OFFICES IN PRINCIPAL CITIES

Pacific Coast Office: Monadnock Building, San Francisco, Calif.

Copperweld GUY AND MESSENGER Strand

Dedicated to Progress . . .

ON SEPTEMBER 30, 1947, we dedicated our new ceramic research laboratory to the service of the Electrical Industries. In honor of the originator of the wet-process porcelain insulator and founder of our company we have named it the Fred M. Locke Ceramic Research Laboratory.

Locke research has contributed much in the past . . . the original suspension insulator . . . the first switch insulator . . . the first high-strength suspension insulator . . . Compression Glaze and Compression Sand . . . the Hi-Top design . . . and many others.

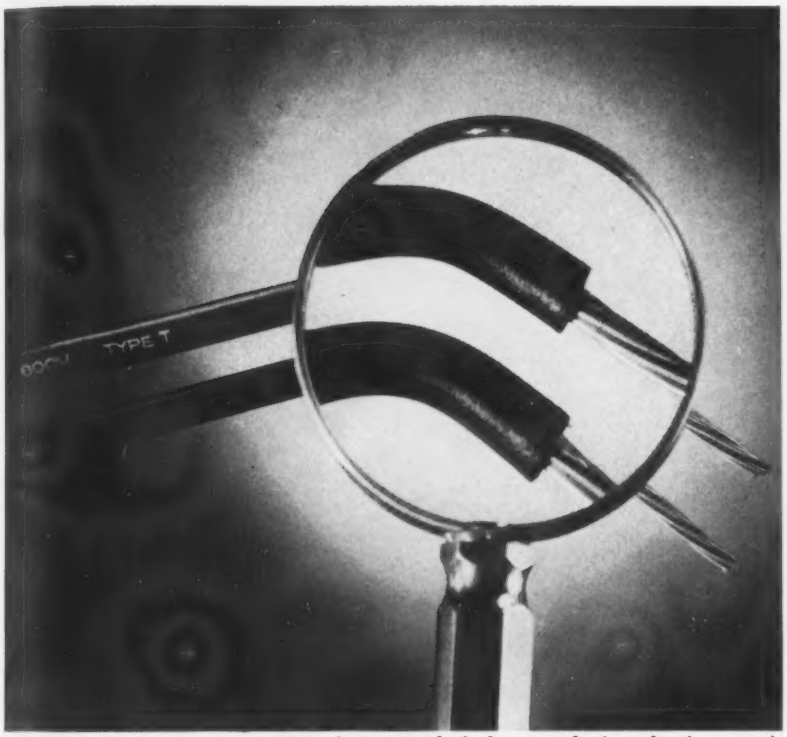
It is our hope and belief that our new facilities will continue to add to this impressive record. You can continue to look to Locke for leadership in insulator research and engineering.

Locke

INSULATORS *and* POLE LINE HARDWARE

LOCKE INSULATOR CORPORATION • BALTIMORE 30, MD.

EVEN *WE* CAN'T TELL WHICH CAME FIRST!



Actual, unretouched photograph of production samples of old and new G-E thermoplastic building wire.

Look at these two samples of General Electric thermoplastic building wire. Both were bent to a sharp angle for this photograph. One sample is right off today's production line—the other goes back to *prewar* days, when General Electric first developed building wire of this type.

Can you see any of the cracks that normally show up on an old piece of wire? We couldn't, even under a magnifying glass. And no wonder, for General Electric thermoplastic is really made to last. Unlike many insulations of natural organic origin, it just stays *as is!*

Today, the earliest users of General Electric thermoplastic building wire are coming back for more and more of it. They have found out by experience that T and TW not only last, but save time by pulling easily and stripping freely. They save money by permitting fast installation.

Thermoplastic
First . . . and foremost
Type T Building Wire

Remember, General Electric *introduced* thermoplastic building wire, so don't buy or specify by type alone — ask for General Electric thermoplastic! Get all the facts by writing to Section W57-1225, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.

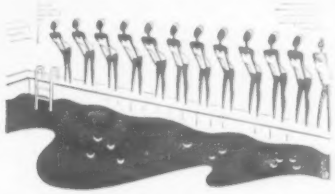
GENERAL ELECTRIC

AROUND THE CIRCUIT With Your

Merchandise Distributor

THERMOPLASTIC INSULATION plays an important role in cable insulation today, too. Take PVX, for instance. This nonmetallic sheathed cable is lighter, has smaller diameter, and is more flexible than ordinary cables. These features are the result of skilled engineering in cable construction. They are built into PVX, to give you easy handling, to speed installations, and to *keep PVX on the job* after it is installed. Let us give you more information on this outstanding cable. You'll find many uses for it.

A DOZEN BATHS A DAY may sound like overdoing things, but not when you are talking about General Electric's testing laboratories. Here, samples of wire or cable are immersed in oil or water and



tested for dielectric strength and insulation resistance. Many thousand tests for these and other properties have been made for your protection. These careful checks on quality mean that when you order any General Electric wire or cable you can always be sure that it will perform long and well.

OIL, ABRASION, AND ABUSE — they can add up to more business for you when you show your customers how General Electric's Flamenol* cords can protect portable tools from these *service-shortening* enemies. Flamenol cords resist many common hazards, such as acids and alkalies, twisting, kinking, and impact. Their long service will please your customers, and will bring them back for more business. Ask us about the three available types — heavy duty, medium duty, and rip cord.

*Trade-mark Reg. U. S. Pat. Off.

Cables run COOL in TRANSITE DUCTS

- **reducing copper losses**
- **increasing current capacity**
- **prolonging insulation life**

TESTS in the J-M Research Laboratory prove that Transite Ducts dissipate heat rapidly—keep cables cool and in this way reduce copper losses and increase current carrying capacity.

Made of asbestos and cement, Transite Ducts are strong, immune to rust and rot. They are incombustible—will not support flame, cause smoke, fumes or explosive gases. Being non-metallic, they are unaffected by electrolysis or galvanic action.

Transite Ducts have a permanently smooth bore that makes possible long cable pulls and easy replacements. Long, lightweight lengths can be quickly and economically installed. In addition, a full line of fittings simplifies even the most complicated installations.

For full information on Transite Ducts, write for Data Sheet DS-410. Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville ***TRANSITE DUCTS***

CONDUIT for use without concrete

KORDUCT for concreting in

BEST PERFORMANCE UNDER FLASHOVER...

...best insulator for ALL operating conditions...

LAPP LINE POST

● If you knew a power company that kept careful records of transmission insulator maintenance and replacement, and, as a result of those records, standardized on Lapp Line Posts for all lines in "hard-to-patrol" areas, wouldn't you consider that a good testimony to Line Post performance? That story is among the Line Post case histories. Many more, too, proving the Line Post superiority under mechanical attack, and in dirt conditions. They're the record of the Line Post trial-under-fire for 16 years, and they add up to one fact—*that lines on Lapp Line Posts have fewer outages, require fewer replacements and less maintenance than comparable lines on any other type of insulator.* Makes the Lapp Line Post a pretty good item for top listing in your Transmission Line Standards, wouldn't you say?

Lapp

INSULATOR CO. INC. LEROY, NEW YORK

INSULATION

A NATIONAL NETWORK OF FULLY STOCKED WAREHOUSES

IWI *Shop Equipment Catalog*

Sixty-four pages showing practically every machine and tool essential to better and more profitable service work. No shop can afford to be without it.

IT'S FREE—ASK FOR YOURS NOW!

Everything for motor repair and rebuilding—insulation, wire, varnish, bearings, tools, machines and 1001 other items — are in stock at your nearest IWI Warehouse — ready for *immediate shipment.*

IWI is a single source for all your needs! No more wasted days of waiting — no more motors out of service for long periods. Now you can eliminate inventories of hundreds of seldom used items — do away with dozens of small orders to individual suppliers — save many dollars of costly transportation charges.

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TWO NEW WAREHOUSES
TO GIVE THE WEST COAST
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AND WIRES
INCORPORATED

TO FILL EVERY NEED OF MOTOR REBUILDING SHOPS

Every product sold by IWI is approved and used by leading electrical manufacturers — every tool and machine is guaranteed to be of proven merit. No matter what your requirements, the *complete line* of IWI can be relied on to help your shop do better, faster, more profitable work.

Trained IWI Field Service Representatives gladly offer their help concerning either materials or machines to assist your shop in saving time or money, or both. Call them without obligation at any time.

DEPEND ON IWI QUALITY

★ EVERYTHING TO
★ KEEP MOTORS AT
★ PEAK PERFORMANCE

IWI *Blue Catalog*

Hundreds of items required for motor repair and rebuilding clearly listed for easy finding and easy ordering. It's the repair shop buyer's guide.

GET YOUR COPY NOW!

HOUSTON ★ NEW YORK ★ ST. LOUIS ★ SAN FRANCISCO

UNderhill 1-5661, 6 MOSS STREET

Mobile Unit, Rochester Gas and Electric Corp. Note economy of space—easy accessibility.

Pre-installation checks and regular operational inspections by William F. Bellor at Rochester Gas and Electric Corp. assure continuous and economical operation.

TIME saved—greater efficiency—lower costs—that's what utility engineers everywhere report when they install G-E 2-way Radio. For instance, H. A. Brown, Engineer of the Rochester Gas and Electric Corp., Rochester, New York, says:

"Power line maintenance has been improved, equipment and crews are controlled to better advantage, and we are making big savings."

General Electric's complete line of 2-way communications equipment, both 30-40 mc and 152-162 mc, provides an efficient system to meet your own special requirements. You can depend on it to establish instant reliable contact between service truck and headquarters when minutes count most.

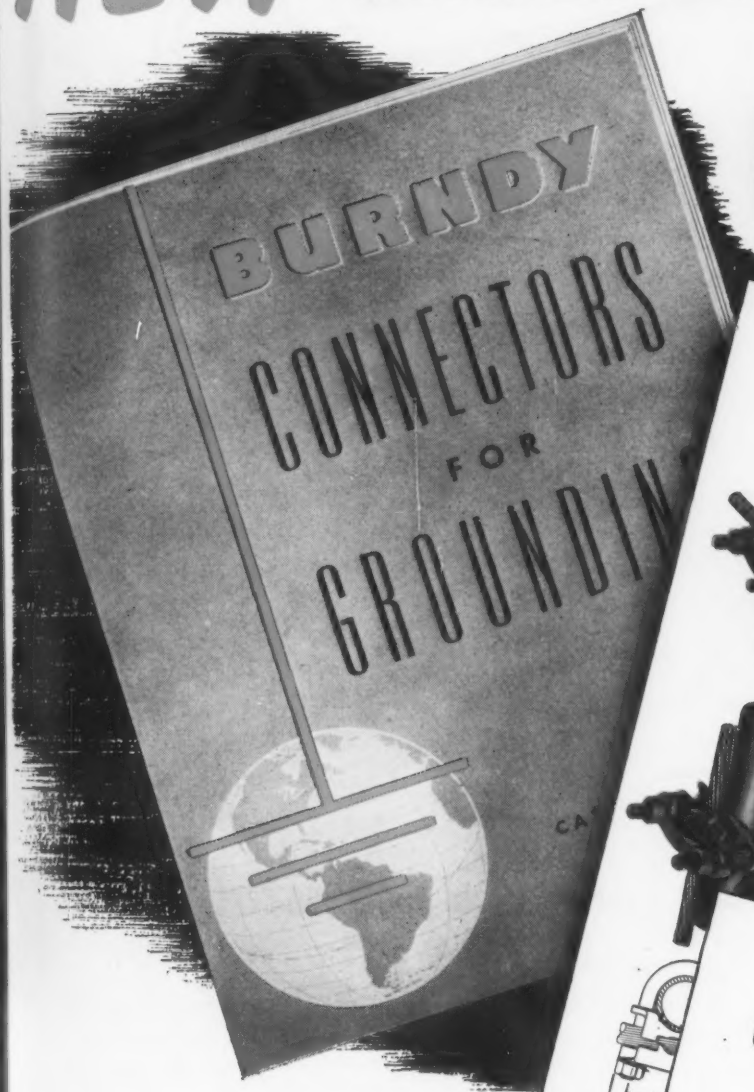
It's easy to be sure of an economical, dependable system. Let General Electric handle the complete job from microphone to antenna. A General Electric sales engineer will be glad to help. For complete information and assistance in planning your radio system, call or write your nearest General Electric office or the Transmitter Division, General Electric Company, Electronics Park, Syracuse, N. Y.

LEADER IN RADIO, TELEVISION AND ELECTRONICS

GENERAL ELECTRIC

163-F4-6918

NEW GROUNDING CATALOG BY BURNDY



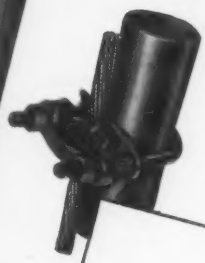
SEND FOR YOUR COPY

This new 32-page Burndy catalog is virtually a reference manual on grounding . . . furnishing not only complete, illustrated catalog data on all types of Burndy grounding connectors available, but also technical information, diagrams and charts on all phases of grounding. Copies are available to all those interested in grounding problems.

Connect with
BURNDY

NEW YORK 54, N. Y.
WESTERN BRANCH: Vernon 11, California • CANADA: Canadian Line Materials, Ltd., Toronto 13 • FOREIGN: Philips Export Corp., New York 17, N. Y.

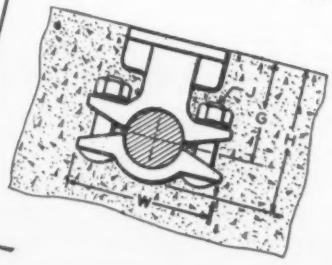
Simplified, 2 Bolt
2-WAY GROUND CONNECTOR
TYPE GAR

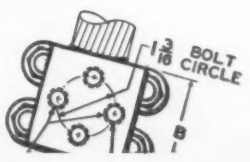


New design permits quick, easy installation of type GAR which connects ground bus either parallel to, or at right angles to rod or pipe. Connection requires merely tightening two nuts on the U bolt. High copper alloy cast body with silicon bronze U bolts, nuts and lockwashers permit burying entire connection without danger of corrosion.

For Grounding in Concrete
GROUND CONNECTOR GFJ

Makes connections for flat bar ground lead to ground cable embedded in concrete. Ground cable is laid and type GFJ ground clamps attached at desired intervals. A flat bar is bolted to the top of the connector which has been tapped for this purpose. Concrete floor is then poured over cable and connector leaving flat bar ground lead rising out of floor.





that's why you benefit by insisting on a *Certified* starter

CERTIFIED on a starter is like STERLING on silver, 100% VIRGIN WOOL on a label, or U.S. PRIME on beef—it is your assurance of tops in quality.

To get the best lighting performance and to get the greatest economy in maintenance of your fluorescent installation, insist on CERTIFIED starters.

Here's why you'll benefit: CERTIFIED starters meet rigid specifications for performance and service. They're *Certified* by Electrical Testing Laboratories, Inc., after testing and checking. You get longer lamp life and longer starter life with CERTIFIED starters.

To be sure you get the best, look for the CERTIFIED shield on the case and on each starter.

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E·T·L·
SPEC. NO. 6

Address inquiries to any of the following manufacturers of

Certified Starters

The Arrow-Hart and Hegeman Co., Hartford, Connecticut
The Bryant Electric Co., Bridgeport, Connecticut
Dura Electric Lamp Co., Newark, N. J.
General Electric Co., Bridgeport, Connecticut
Harvey Hubbell, Inc., Bridgeport, Connecticut
Instant Glow Starter Corporation, New York, N. Y.
Kuthe Laboratories, Inc., Newark, N. J.
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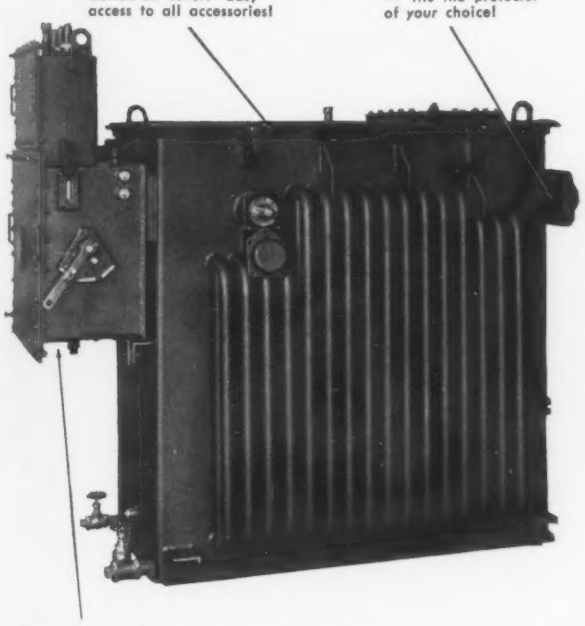
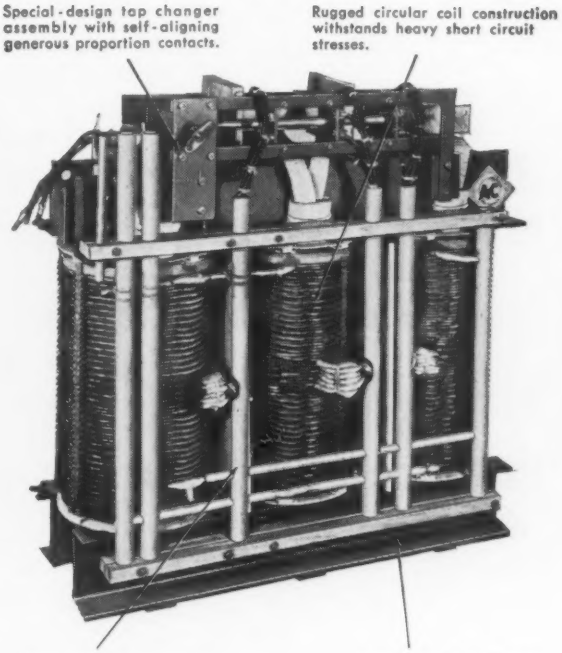
Pass & Seymour Co., Syracuse, N. Y.
Sheldon Electric Co., Irvington, N. J.

These Improved Allis-Chalmers Network Transformers Meet Any Network System Specifications!


Your Choice: Welded-on or bolted-on cover. Easy access to all accessories!
Low Voltage Throat — fits the protector of your choice!
Disconnect and Ground Switch—capable of breaking magnetizing current — electrical interlock prevents operation under load!


Special-design tap changer assembly with self-aligning generous proportion contacts.
Rugged circular coil construction withstands heavy short circuit stresses.
Liberal use of machine-wound tubing for bracing of high and low voltage leads.
More compact design — yet no sacrifice in performance.

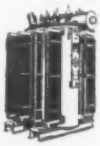
Mechanically "Dependability and long life" are *more* than words in describing *modern* network transformers that have to operate *continuously and without attention* in underground locations! That's why Allis-Chalmers has designed its *improved* transformers with *heavy* copper-bearing, corrosion-resistant steel tanks and *extra*-heavy tops and bottoms . . . with *double-checked* leak-proof welded joints . . . with *shot-blasted*, then *3-coat baked-on* "iron-like" finish! *Smaller in overall size—yet with no reduction in rugged electrical design — they meet any system specifications!*

Electrically Because of heavy short circuit duty requirement of network transformers, core and coils must be designed to withstand high stresses. Allis-Chalmers' *time-proven* circular design — using *outside* core clamping bolts and highly efficient turn-to-turn insulation — permits high thermal capacity, even under the most severe load conditions.

Yes, mechanically *or* electrically these *improved* network transformers add up to a more compact, low-loss, long life design for your network system! Tell us *your* specifications. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

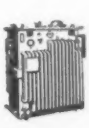
A 2295

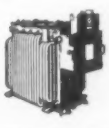
TRANSFORMERS ALLIS-CHALMERS BUILDS:


POWER — 500 kva to largest. Dry-type or liquid-filled.

⅝% STEP REGULATORS — single phase 2.4 to 15 kv; 3-phase 2.4 to 69 kv.

DISTRIBUTION — 1½ to 500 kva. Pole, vault, subway, substation and dry-types.


LOAD CENTER—100 to 2000 kva. Dry or liquid-filled. Indoor or outdoor.


NETWORK—150 to 1000 kva. Vault or subway types.

FURNACE — Indoor or outdoor. Water or self-cooled. All ratings.

INSTRUMENT — potential, current, and signal, indoor and outdoor types; outdoor metering. Standard voltages.

ALLIS·CHALMERS

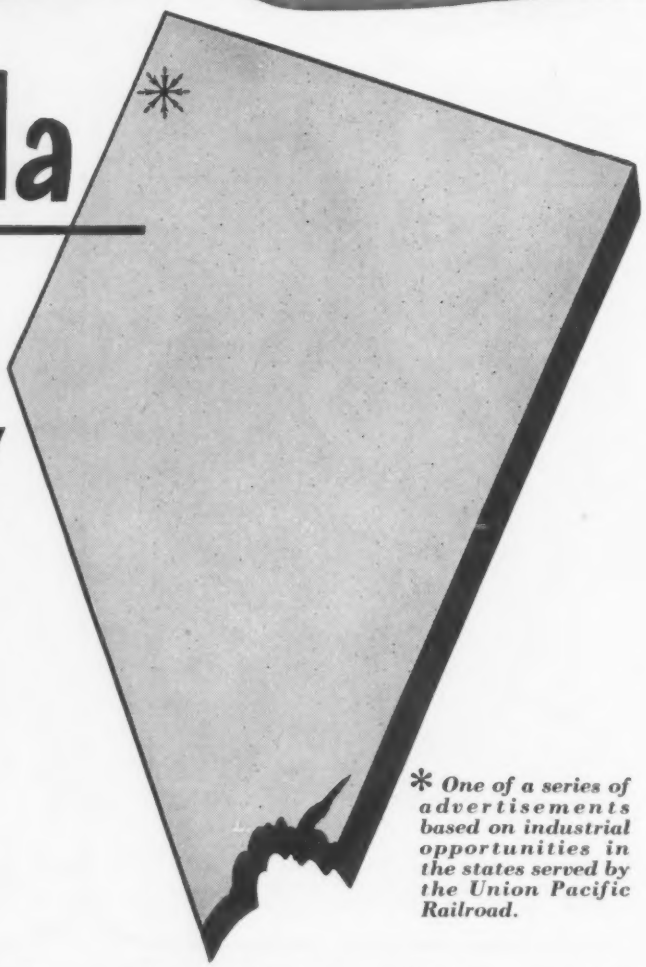
One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Nevada



- *Variety of metals, minerals and ores of value to industry*
- *Power and irrigation projects*
- *Good living conditions*
- *Colorful scenic attractions*
- *Excellent rail transportation*

* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

Manufacturers, packers and processors will find Nevada a storehouse of raw materials. There are deposits of copper, silver, gold, zinc, lead and uranium. Mineral ores and minerals include tungsten, manganese and antimony ore, magnesite, gypsum, sulphur, borax and vanadium. Building stone and marble also are available.

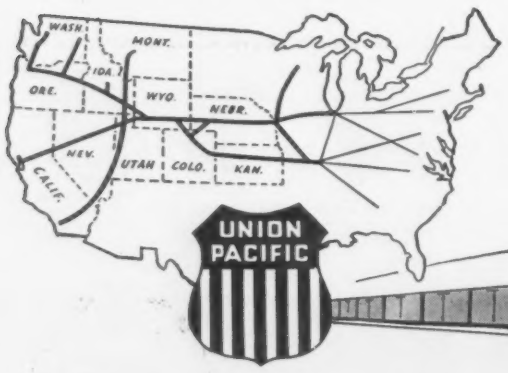
Cattle, sheep and poultry raising are expanding agricultural pursuits and there also is some production of a variety of grains, vegetables and fruits.

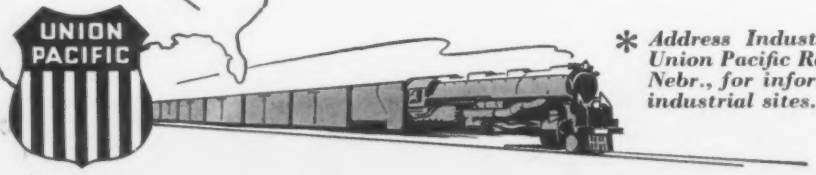
Irrigation and power are supplied by several Federal projects including famous Hoover Dam.

Nevada's healthful climate, excellent educational system, and a variety of scenic attractions contribute to the advantages of living in this western area.

Each year, thousands of vacationists visit gigantic Hoover Dam, beautiful Lake Mead and near-by picturesque Las Vegas.

Union Pacific provides top-notch freight and passenger transportation so essential to a State's industrial development.





* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

SIMPLICITY DEPENDABILITY

TYPE 57-A SIDE BREAK DISCONNECT SWITCH

Model Illustrated
46kv-600 Amp.

Available in
Ratings of
7.5kv to 69kv.
400 Amps. to 1200 Amps.

A Positive electrical contact is assured under all climatic conditions by full-floating contact shoes in weather protected jaw assembly.

B Years of field operation have proven the ruggedness and dependability of the simple hinge mechanism in all-weather operation.

C Terminal swing with non-corrosive roller bearing performs in all seasons with no maintenance or lubrication.

D Hinge-end shunt provides copper path from blade to terminal. Flexible Copper shunt is tinned for higher corrosion resistance.

E Non-corrosive main bearing requires no lubrication and assures efficient operation in all seasons.

• • •

Write for bulletin No. 365

Southern States Equipment Corp.

HOME OFFICE AND FACTORY — HAMPTON, GEORGIA

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DENVER, COLORADO	JACKSON, MICHIGAN	DALLAS, TEXAS
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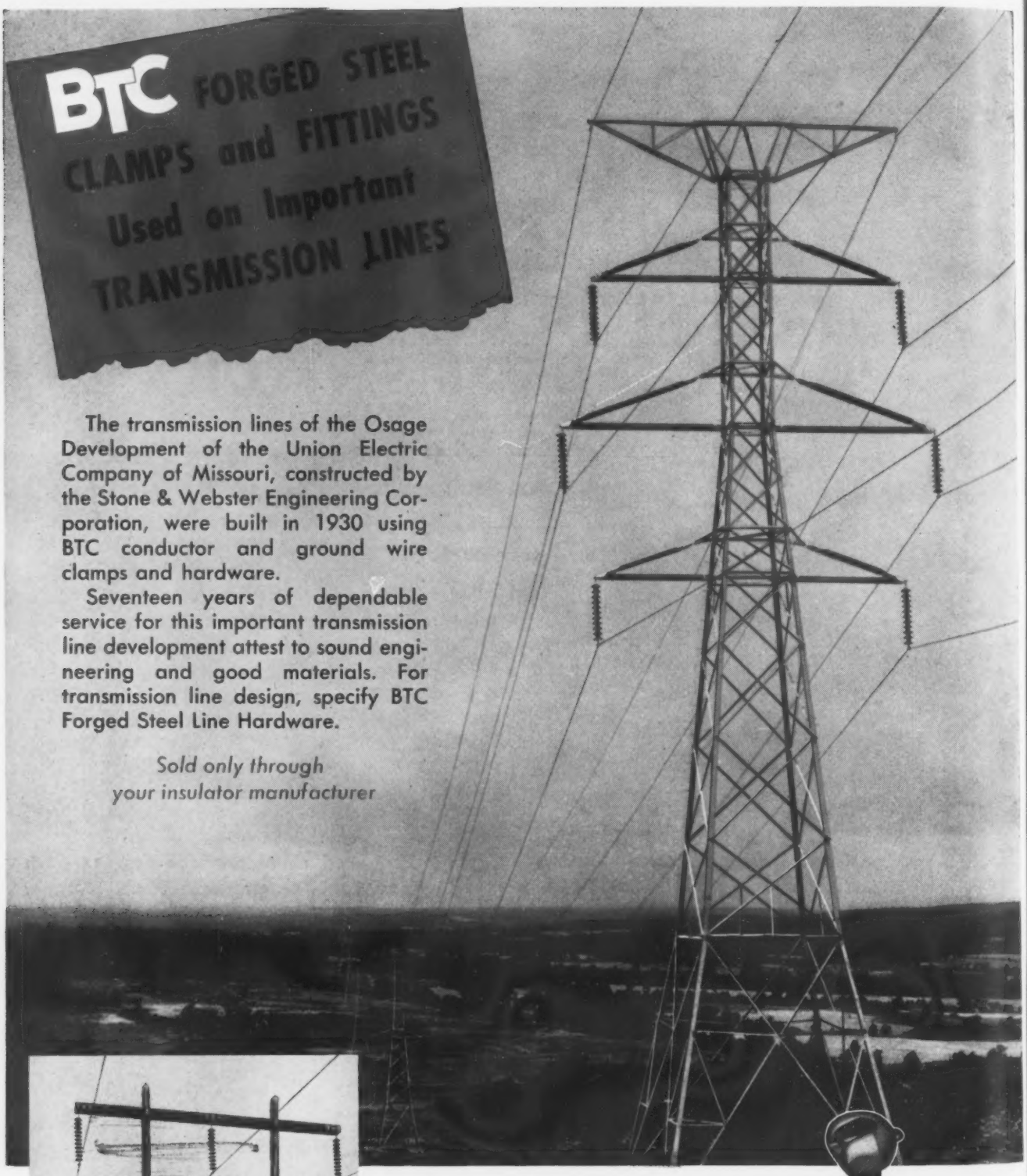
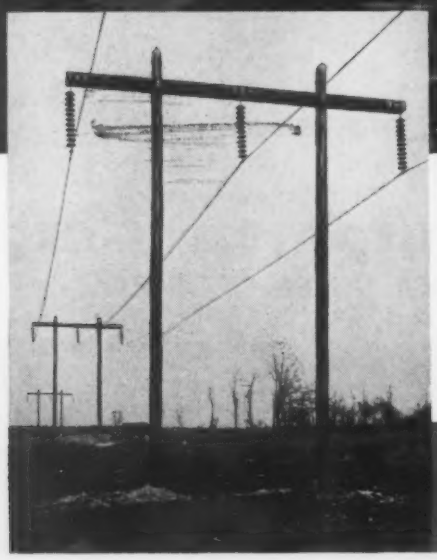
BTC FORGED STEEL CLAMPS and FITTINGS Used on Important TRANSMISSION LINES

The transmission lines of the Osage Development of the Union Electric Company of Missouri, constructed by the Stone & Webster Engineering Corporation, were built in 1930 using BTC conductor and ground wire clamps and hardware.

Seventeen years of dependable service for this important transmission line development attest to sound engineering and good materials. For transmission line design, specify BTC Forged Steel Line Hardware.

Sold only through your insulator manufacturer





Above: The 119.5-mile Osage-Rivermines Line with steel towers and hinged wood cross-arms carrying 250,000 cm. copper conductor, 138 kv., and 7/16" Siemens Martin galvanized steel ground wire.

Left: The Osage-Page Line covers 135.5 miles with wooden "H" frame structures carrying 336,400 cm. A. C. S. R. conductor, 138 kv., and 7/16" S.M. galvanized steel ground wire.

7200 SERIES

THE BREWER-TITCHENER CORPORATION

CORTLAND, NEW YORK

Combined...

TO GIVE YOU *DOUBLE* UNDERGROUND PROTECTION

Developed primarily for direct earth burial or duct service, RoMarine-RoPrene combines a superior moisture resistant insulation with the well known durability of a Neoprene jacket. Here is a *double* protection. You get an underground cable of high electrical stability in the presence of moisture, with long life, as well as resistance to oils, soil acids and alkalies, and other corrosive elements. Unaffected by sunlight and oxidation, it possesses superior weathering properties . . . If it's going underground, remember RoMarine for high quality, low water absorption, insulation . . . and RoPrene for rugged, long life sheath protection. Combined, they assure a long service life of dependable operation.

RoMarine-RoPrene is available in a range of sizes in both single and multiple conductors.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

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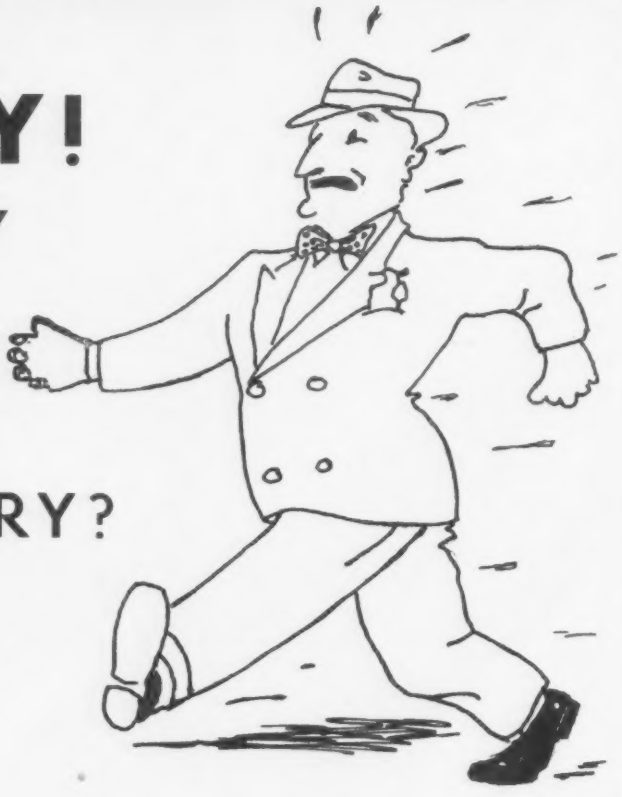


HEY!
WHY
ALL
THE
HURRY?

Just heard about the

SECOND ANNUAL INDUSTRIAL ELECTRICAL . . . SHOW . . .

MARCH 18-19-20, 1948
at
THE LOS ANGELES ARMORY

and I don't want to miss it !

Sponsored by
The Electrical Maintenance Engineers
Association of Southern California, Inc.

ELECTRICAL BOOKS

RADIO ENGINEERING by F. E. Terman (third edition) ; 969 pages, 6x9, McGraw-Hill, $7.50.

Third edition of this standard text continues with the thorough treatment of fundamentals of radio engineering typical of the earlier volumes. Condensation of material new in concept fifteen years ago when the first edition was published has allowed the author to take into account the enormous changes of recent years without materially increasing the length of the book.

Over 80% of the text has been rewritten to incorporate important changes in the field, especially in ultra-high frequency and microwave techniques. A new chapter on circuits with distributed constants gives a concise summary of properties of transmission lines, wave guides, and cavity resonators. Those interested in radio broadcasting will find material on transmitters and receivers, antennas, television, and sound equipment.

POWER SYSTEM STABILITY VOL II—TRANSIENT STABILITY by Selden B. Crary; 329 pages, 5½x8½, illustrated, Wiley, $6.

Second of a two-volume survey and development of theory of stability and its application to system and apparatus design. (Vol. I, *Steady State Stability* was originally published in 1945.) Careful, well-illustrated discussion of factors affecting transient stability includes occurrence, type, and location of short circuits; response of system to sudden changes in voltage and current; speed of circuit breakers and relays; and response of excitation systems and governors of synchronous machines. A 17-page bibliography indicates the wide scope and thoroughness of the work done on this volume, which should be of great value to all interested in this important subject.

ROME CABLE MANUAL OF TECHNICAL INFORMATION published by Rome Cable Corp. 263 pages, 5x7½, semi-flexible cover, $2.50.

A sturdy book printed in large type on moisture-resistant paper, it is divided into eight sections covering a wide variety of technical information. First section (116 of the 263 pages) is devoted to wire and cable, gives comprehensive coverage from definitions and specifications through wire gages, capacities, insulations, sheaths, and color coding. This is supplemented by audio and radio frequency wire and cable data, a section on wire and cable engineering calculations and data, and data from the National Electric Code.

General technical information includes standard connection diagrams, power factor correction table, and useful miscellaneous formulas. Conversion tables and mathematical tables, including Bessel functions round out the book.

ELEMENTS OF ELECTRICAL ENGINEERING by A. L. Cook and C. C. Carr (fifth edition). 662 pages 6x9, John Wiley and Sons $5.

Fifth edition of this widely used textbook is again devoted primarily to presenting a clear well-rounded foundation as basis for further study of electrical engineering or for those specializing in other fields. Use of formulas is kept to a minimum, and emphasis is on illustrations and a wealth of problems based on data typical of actual practice.

(Continued on Page 36)

This switch says plenty by keeping silent

Shhh! Here's silence that's really golden—for you. Quieter than the drop of a pin (you can hear *that*), yet the G-E Silent Switch's very lack of noise is one of the loudest-talking salesmen you can have on the job.

Think a minute. What builds your customers' confidence in you? It's your reputation and the quality of work you do, of course. But did you ever stop to consider how important, too, is the reputation and performance of the wiring you install?

That's where G-E Silent Switches come in, and all the other products in the full line of G-E wiring devices. They are the *visible evidence of quality* on every job. Their name signifies long life and reliable service to every user. Why not install General Electric throughout, and let that big name go to work for you?

WIRING DEVICES by

GENERAL ELECTRIC

say "G.E." and he'll agree

Wiring Briefs from your G-E Distributors

Are you familiar with the great variety of products in General Electric's full line of wiring devices? Do you know the interesting features that help to make them easy to use and easy to sell? Keep an eye on this column, and you may discover a lot of useful facts and information. We'll keep dishing them out for you.

Now, the entire Watch Dog* line of starters meets a new, high-temperature rating. Maximum recommended operating temperature has been increased from 140 F to 160 F. This is important in installations that are enclosed, or that are subject to high ambient temperatures.

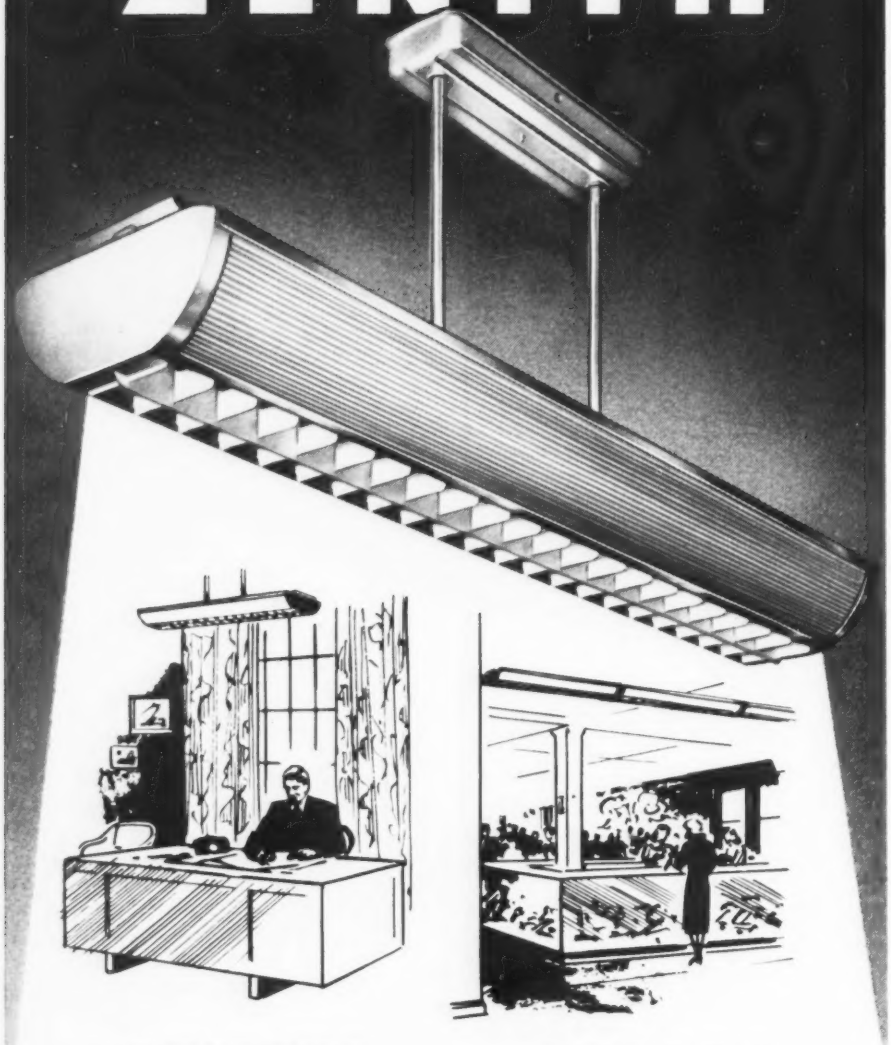
Whether you are already on the profitable fluorescent lighting bandwagon, or just trying to hitch a ride, you need this new folder on "G-E Fluorescent Accessories." It shows you—and your customers—what products G.E. is making, and how you both can use them to advantage. Tells about Watch Dog and standard starters; Slimline, Circline, and Twin Turret Lampholders; and fluorescent starters and switches. Ask us for a supply today.

A certain well-known soap has nothing on those boys in G.E.'s "fuse factory." Do you know that the zinc used in General Electric fuse links has to be *99.98 per cent pure* by laboratory test? Good point to remember when you order the next batch of fuses.

If you want additional information on these, or other G-E Wiring Devices, ask us—your G.E. Merchandise Distributor—or write to Section D50-1118 Appliance and Merchandise Dept., General Electric Co., Bridgeport 2, Conn.

**Trade-mark Reg. U.S. Pat. Off.*

Planned Lighting with
ZENITH



OFFICES . . . STORES

Here's a commercial fluorescent luminaire that's engineered for superlative lighting performance — yet costs only a very little more than conventional equipment. Precision formed on precision tools, the Zenith installs easily, services quickly. Polystyrene plastic side panels are light, strong and shatterproof. The shielding unit controls the light for greatest effectiveness, with a minimum of of surface brightness. The Zenith may be installed individually as shown, or in continuous mounting.

Write for the new Zenith catalog sheet

Offices in Principal Western Cities

SMOOT-HOLMAN COMPANY
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

Branch and Warehouse in San Francisco

FOR THE BEST IN INDOOR AND OUTDOOR LIGHTING IT'S SMOOT-HOLMAN

(Continued from Page 34)

Discussion and diagrams of Amplidyne and Rototrol applications have been added to the section on d-c machinery. Section on a-c machinery has been expanded to include dry-type transformers, synchros and saturable-core reactors. Basis for simple vectors used in explanation of a-c circuits is contained in a short chapter devoted to vectors and their mathematical representation. Material has been added to give a complete and concise treatment of electron tubes, circuits and applications in line with their expanding use throughout the industry.

ELECTRIC MOTOR MAINTENANCE by W. W. McCullough, 126 pages, 5½x8½, Wiley, $2.

Practical simplicity is the keynote of this compilation of the fundamentals of motor maintenance. Divided into sections on mechanical maintenance, electrical maintenance, and operation and application, it combines brief explanations of why certain steps are so important and detailed instructions in how they should be performed. The section on electrical maintenance covers various types of insulations, and dwells at some length on cleaners, solvents, and their use in special cleaning and drying techniques.

LETTERS TO THE EDITOR

To the Editor:

We note with interest your editorial on Mexican customer strikes as printed in the September issue of your magazine. You will be interested to know that such strikes are not unusual and take various forms. The most customary one takes the form of a refusal on the part of all customers to pay their bills. This is usually a well-organized movement and, as you can well imagine, it leaves the utility in a very peculiar position. This form of strike is usually used to protest the charges of the utility.

I thought this additional information might be of interest to you.

Very truly yours,
G. C. DELVAILLE
Vice-President
California Electric Power Co.
Riverside, Calif.

To the Editor:

Will you please accept a two-year subscription for a buddy of mine? We were together in the Pacific for over two and one-half years, extending and building bases to advance from. I have a wealth of legal and official photos for an interesting and human interest story on our base "and" island work.

I carried three issues to the South Pacific Islands in 1944 and Pearson supervised the loaning of them for the duration—they were in great demand.

Enclosed you will find check for a two-year subscription, to be mailed to: Clarence B. Pearson, 226 No. 8th St., Baton Rouge (with *Gulf States Utilities*), La.

GEORGE C. SHEETS, SVC. No. 6177876
558 W. 3rd St.
Pomona, Calif.
Southern California Edison.

in wire and cable

HIGH CURRENT CARRYING CAPACITY?

CHEMICAL INERTNESS?

FLAME RESISTANCE?

BETTER AGING?

FLEXIBILITY AND EASE OF WORKING?

WIDE SELECTION OF COLORS?

U·S·S Ampyrol has them

Of all the electric wire and cable manufactured by American Steel & Wire Company, U·S·S Ampyrol is probably the most versatile. It can be used for hundreds of applications including electronic devices, building wiring, switchboards, motor leads and shipboard wiring.

U·S·S Ampyrol insulation is a thermoplastic resin compound which is chemically inert. It is unaffected by acids, alkalis, oil, moisture, grease and many common solvents. It will withstand ozone, oxygen and direct sunlight. Ampyrol does not support combustion. It has excellent aging qualities and remains flexible without cracking.

The chief difference between Ampyrol and other polyvinyl chloride insulations is in the method of manufacture. American Steel & Wire Company has developed special processes which assure better control at the mill. The resulting product is uniformly high in quality and physical characteristics.

If you have a difficult wiring job, find out about U·S·S Ampyrol. Write for complete information on types and sizes available.

American Steel & Wire Company
Cleveland, Chicago & New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S Ampyrol Wire and Cable

First Year of a Lifetime

After only one year of active production, Slater has achieved significant stature as a manufacturer of wiring devices.

Like a new kid on the block, Slater a year ago offered its products in competition with those of a long known, highly respected group of suppliers, whose markets had seen no new face in two decades.

In a short twelve months, Slater has enjoyed twice the volume of business projected for itself, doubled the number of devices initially in its line.

Slater's top management is thoroughly experienced in this field. Its engineers and production men learned their jobs in the birthplace of the wiring device industry—the plants in New England and the Connecticut Valley. Its modern new plant includes the latest developments in production machinery. Slater products are top-quality, produced in full compliance with Underwriters' Laboratories' specifications.

To the wholesalers, contractors, and manufacturers who have shown such great confidence in us and our products during this first year, our sincere thanks; and the promise that Slater will continue to grow in their service throughout its LIFETIME.

Slater

ELECTRIC & MFG. CO.

56th STREET and 37th AVENUE, WOODSIDE, N. Y.

Lifetime wiring devices

PRODUCT NEWS

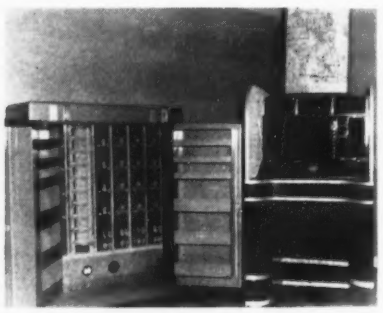
Oil Circuit Breakers (1200)

Allis-Chalmers has announced an improved line of high-voltage, high-speed quick-clearing (5 cycle) outdoor, floor-mounted oil circuit breakers, Type BZO-160. These units are in ratings from 115 to 230 kv., up to 3,500,000 kva. interrupting capacity.

Retained in the improved breaker are the single-break, 5-cycle Ruptor arc extinguishing device and the pneumatic operator with self-contained automatic air supply system. Elimination of external conduit on the side has resulted in a smooth exterior. General decrease in tank diameter has cut down on amount of oil required.

Other improvements include a weatherproof mechanism box on top of each tank, readily accessible for adjustment; improved oil and gas seal for pole unit tanks; provisions for removing either bushings or bushing current transformers without disturbing the other. Complete oil maintenance facilities are afforded on each pole unit tank by means of a fill valve and combination drain and sampling valve, plus a float-type oil gage.

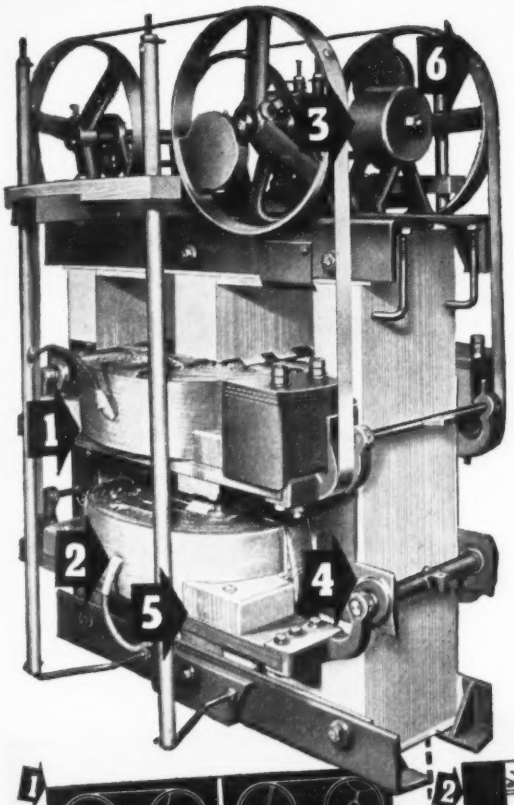
Fleet Control Device (1201)



Electro-Dispatcher is a new control device for fleet units equipped with two-way radio. By means of "memory relays" it absorbs information put into it, and at the touch of a button answers any operational question or selectively calls a unit by radio. Developed originally for fleet units such as taxicabs, it is adaptable to utility trucks and service cars, police departments, railroads and air lines to indicate and record each mobile unit. By a slight variation the "memory robot" can be used to automatically record seats available for airplane passengers, making a record of the number of seats sold, direction of flight, date for which scheduled, etc., and can furnish this information immediately at the touch of a button in any of the airline offices across the country. Inventory control for warehouses and stores, is another use. Amount of stock, type and location can be instantly ascertained. The idea for the Electro-Dispatcher was developed by H. I. Pierce, now president of the Electro-Dispatcher Corp. of Seattle.

Power Relay (1202)

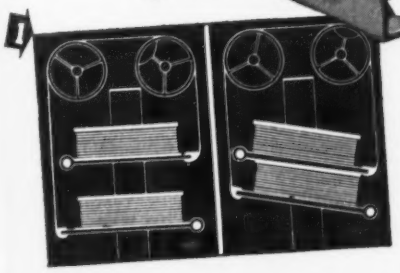
The Allied Control Co. BO power relay is a small-size, multipurpose unit available for either a-c or d-c coil operation. Contact arrangement provides double pole, double throw or double break with ¼-in. contacts rated at 15 amp. Insulation is of molded bakelite.



MOLONEY *Constant Current* TRANSFORMERS

For closer regulation . . . faster coil action . . . longer lamp life. Moloney Constant Current Transformers with double-moving coil action, sturdy construction, and ball-bearing equipped moving parts require practically no adjustment or attention after proper installation. Available in Pole and Subway Types, with or without capacitors, and in air-cooled Automatic Station Types.

CHECK THESE SUPERIOR FEATURES ✓ ✓

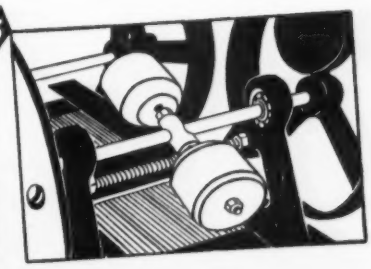


Double Moving Coils

Each coil moves one-half the distance of the single moving coil in ordinary regulators. Normal secondary current is attained quicker upon load changes or primary surges, with coils parallel throughout operation. Lower kinetic energy practically eliminates force on bumpers during short circuit.

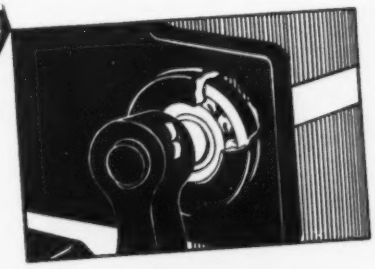
Extra-Flexible Leads

Extra-flexible cable is used for leads to prevent sluggish movement of the coils and to avoid service interruptions due to lead breakage. To protect and support them, leads are brought up to the terminals through heavy insulating tubes which are firmly anchored at both ends.



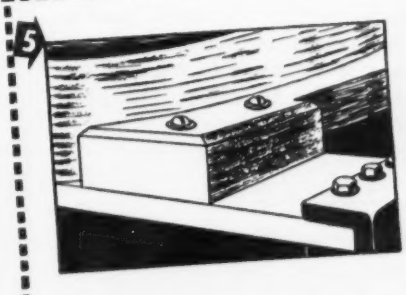
Adjusting Weight

The adjusting weight is mounted at the top on the shaft of one of the pulley wheels. It is arranged with a vernier for accurate and accessible adjustment. After adjustment is made, the weight is securely locked in position at the factory to deliver constant rated current. No adjustment is necessary when installing.



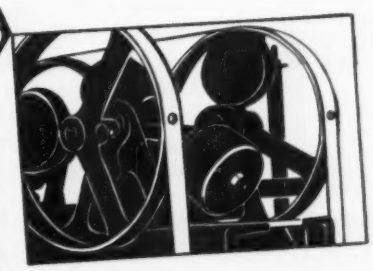
Ball Bearings

All moving parts are fitted with precision ball bearings to eliminate friction. The coils are hinged on ball bearings, the primary at one end and the secondary at the other. Hinge points are rigidly fixed by metal plates bolted to the core.



Coil Mounting

The supports on which the coils are mounted are designed to withstand impact between the coils themselves and impact between the coil supports and the bumpers, under the most severe operating conditions. Coils are rigidly blocked on the supports to maintain accurate alignment.



Stainless Steel Bands

Corrosion-proof stainless steel bands are securely fastened to the moving ends of each coil and to the pulley wheels to hold the coils parallel for the complete range of operation. These stainless steel bands last indefinitely.

Send for bulletin SL-701 describing Moloney Constant Current Transformers

MOLONEY ELECTRIC CO. ☆ ST. LOUIS 20, MO.

POWER AND DISTRIBUTION TRANSFORMERS EXCLUSIVELY SINCE 1896

CRESCENT

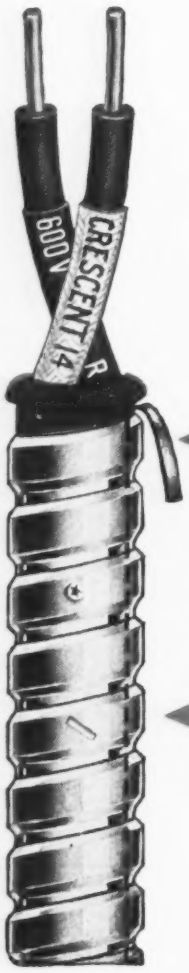
ABC Armored Cable

Has These Improved Features Which Result in

INCREASED SAFETY

and

LOWER COST



Bond Strip Under Armor

Permanently low armor resistance **is provided in sizes No. 14 and 12 AWG by use of a flattened bonding wire which is in contact with the under side of each convolution. These sizes now are smaller and lighter, since they use the smaller diameter Type R conductors of the 1947 National Electrical Code.**

Prefabricated Break Lines

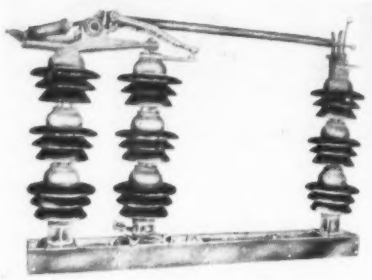
The Cut Mark (at 1½" intervals) shows the location of a prefabricated breaking line inside the armor. Only a few strokes of a file guided by the Cut Mark are required to cut through one outer ridge, and a bend by hand severs the armor. This results in a clean separation with no sharp edge — a safer, easier and faster job. The prefabricated breaking lines are so designed that there is *no reduction* in tensile strength, bending quality, crushing resistance and electrical conductivity of armor.

The Armored Cable Industry is celebrating its 50th Anniversary. In the last 20 years alone over SIX BILLION FEET of Armored Cable have been installed.

CRESCENT WIRE and CABLE

CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

Airbreak Switches (1203)



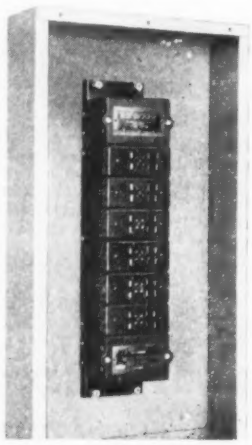
Schwager-Wood Corp. is in production with its Type TA line of airbreak switches of the vertical break, rotating insulator type. Voltage range is 46 to 230 kv.; current range, 600 to 1,200 amp.

The switch is of the rotating blade type in which pressure at the contact is released by initial rotation of the blade. A single lever accomplishes the initial rotation and the subsequent lifting of the blade. Absence of cams or multipliers is said to simplify the design and operation. Switches of 69 kv. and above are counterbalanced. Since the switch is designed for installation in either vertical or horizontal position without additional parts, the purchaser is not required to decide on type of installation at time of purchase. It is supplied as disconnecting switch or as horngap switch.

Since the blade hinges above the rear insulator instead of the middle insulator, a substantial increase in horizontal break distance is secured, according to the manufacturers, who state that this change in the conventional design makes the switch extremely effective for interruption of exciting currents and charging currents of transmission lines.

Plug-In Panelboard (1204)

A plug-in panelboard with thermal-magnetic multibreakers has been announced by Square D in 100- and 200-amp. main rating, 120/240 volts a-c with 15-, 20- and 30-amp. branch circuits. Advantages claimed for this type panelboard include improved utilization of space on walls and columns; increased gutter space; easy and speedy removal or insertion of multibreaker units for changes in circuit ratings or additional circuits. High-speed coilless magnetic and thermal trip of the MO4 breaker is said to give adequate time lag for starting motors and tungsten lamp inrush currents. The breaker units regularly provide four single poles which can be converted into two double poles by insertion of handle ties, either in the field or at the factory.



You can tell, just by looking at this ballast, that it...

WILL GIVE MAXIMUM LAMP PERFORMANCE!

WILL OPERATE QUIETLY!

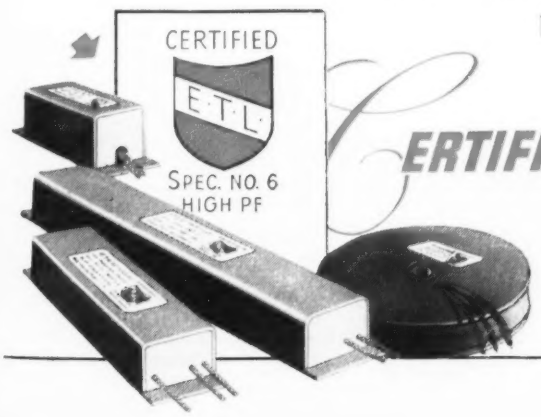
GIVES DEPENDABLE, LONG SERVICE!

WON'T OVERHEAT!

Simply insist that ballasts you use carry the "CERTIFIED" label. Then you're sure you'll get satisfactory operation—that your customers will enjoy a trouble-free, dependable product.

CERTIFIED BALLASTS are manufactured to rigid specifications that assure you of best possible performance. They are then tested and checked by Electrical Testing Laboratories, Inc., against these specifications. When they pass this testing, they are CERTIFIED.

By insisting on CERTIFIED BALLASTS in the fluorescent lighting equipment you sell, you practically eliminate customer complaints—build better customer acceptance and goodwill.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2138 KEITH BLDG., CLEVELAND 15, OHIO

APPROVED • NEATER • FASTER • STRONGER •

use BRIEGEL ALL-STEEL INDENTER-TYPE fittings

Select the best, insist on Briegel All Steel Fittings, the only approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers—more profits from each job!

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Clayton Mark & Co., Evanston, Ill.
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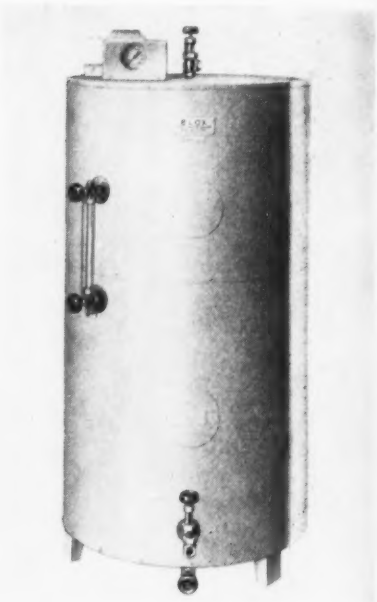
All B-M Fittings Carry the Underwriters Seal of Approval

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

Electric Steam Accumulator (1205)



Coast Engineering Co. announces the Blox electric steam accumulator, an automatic steam generating plant operating on the heat storage principle. The electric steam accumulator, developed by V. A. Bloxham, manager of Coast Engineering, while he was with the Edison company, is for use in the dairy sterilizing field, in department stores and dress shops for garment conditioning and wherever moderate amounts of high-pressure dry steam are needed.

Two units are being made, one with 50- and one with 100-gal. water capacity. They use automatically controlled heating elements of 2,000 and 5,000 watts. The new model has been improved for greater capacity, versatility and efficiency, according to the company announcement.

Plastic Tubing (1206)

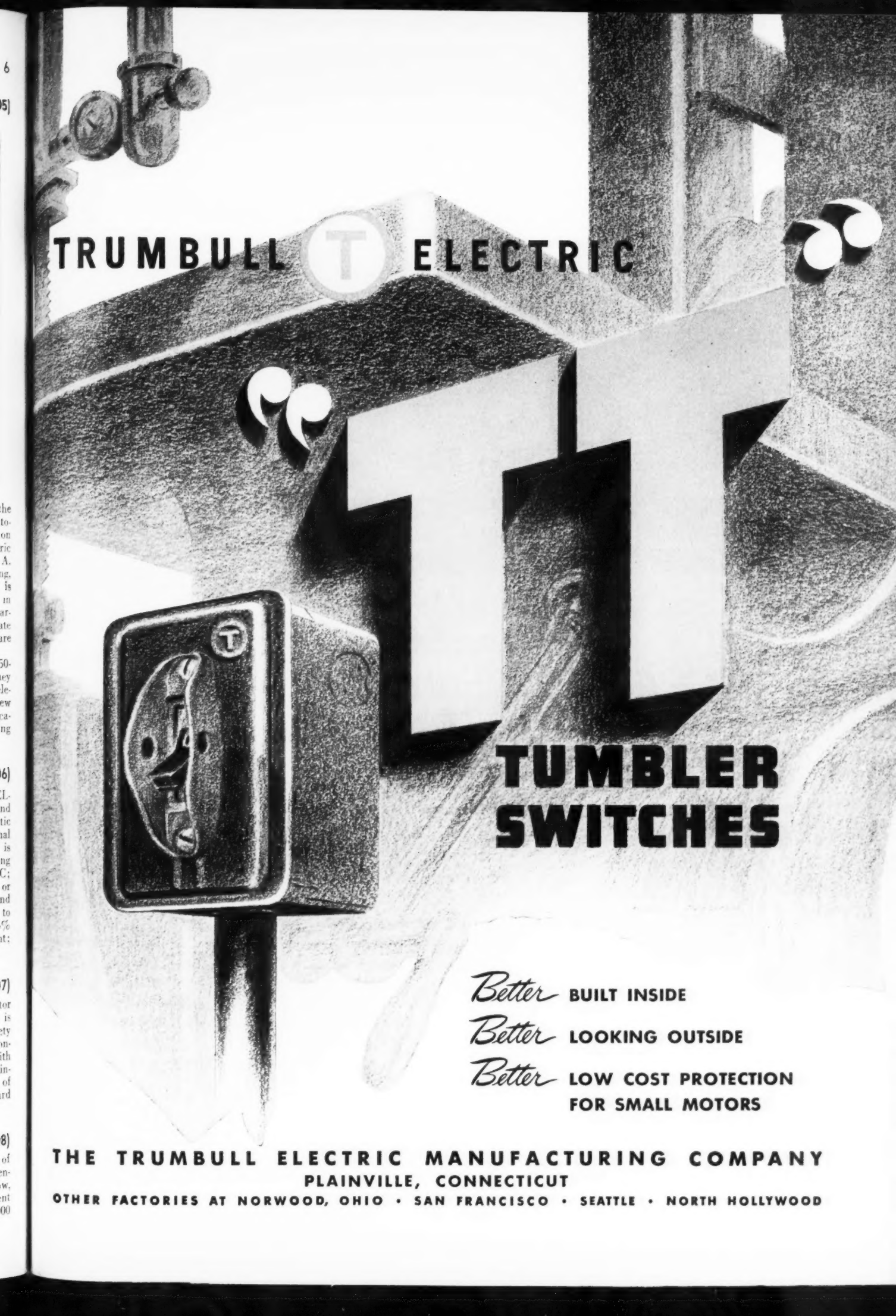
Turbo extruded plastic tubing, Type REL-16, has been announced by William Brand & Co. This heat-resistant, thermoplastic tubing is said to correct previous thermal limitations of polyvinyl compounds. It is stated that in tests, no failure or cracking was indicated after one hour at 120°C; after 2,400 hours at 135°C, no sag flow or crack when cooled and bent 180° around 5/16-in. mandrel; 4-in. samples exposed to 135°C for 30 minutes showed less than 3.5% shrinkage. Turbo REL-16 is flame resistant; water absorption is negligible.

Capacitor (1207)

Cornell-Dubilier's Type RC-108 capacitor has a rating of .05 mfd. 3,500 VDC and is said to have an exceptionally high safety factor. It is built in a cylindrical metal container 1½ in. in diameter, 3 in. long, with screw-type terminals mounted on ceramic insulators protruding ¾ in. from each end of the base. A wax-impregnated cardboard sleeve insulates the sides of the case.

Disconnect Switches (1208)

The Hi-Voltage Co. has a new line of hook-operated disconnect switches for general outdoor use. They come in single-throw, double-throw and transfer types; current handling capacities range from 200 to 2,000 amp. and from 7,500 to 115,000 volts.


TRUMBULL T ELECTRIC
TT
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SWITCHES
Better BUILT INSIDE
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FOR SMALL MOTORS
THE TRUMBULL ELECTRIC MANUFACTURING COMPANY
PLAINVILLE, CONNECTICUT
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KLEIN PLIERS!

. . . PREFERRED BY LINEMEN

Wherever there are linemen . . . whatever the job—tough or routine—you'll find Klein Pliers.

There's good reason for this widespread preference that began when the electrical industry was in its infancy and has continued on through the years.

Linemen know they can depend upon the quality and performance of Klein Pliers. Drop forged from the finest alloy steel, each pair is individually tempered and tested—has the proper balance—just the right spring to the handles to minimize hand fatigue. A fitted hinge keeps jaws perfectly aligned—the carefully matched knives cut swiftly, surely and stay keen for years.

The complete Klein line includes pliers for every use. Your supplier will fill your order as quickly as possible.

Ask Your Supplier

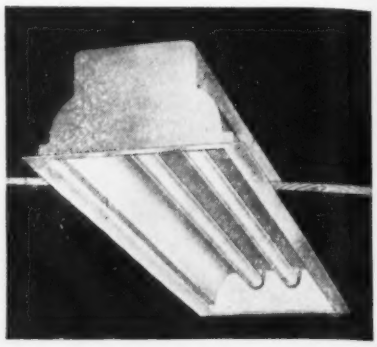
Foreign Distributor: International Standard Electric Corp., New York

A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

Since 1857

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

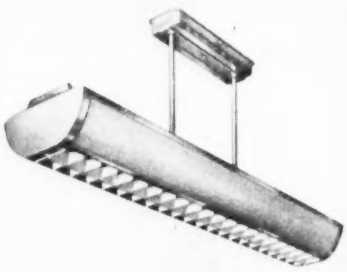
Lighting Unit (1209)



Leader Electric Co. has a new line of Trofferlite units in 12-, 24 and 13¾-in. widths, in deep or shallow construction. The 12- and 24-in. fixtures are made in open, glass-enclosed, baffled and louvered types; the 13¾-in. fixture is available only with Holophane Controlens. The 12- and 24-in. models in deep construction may be had for use with 96- and 72-in. Slimline tubes.

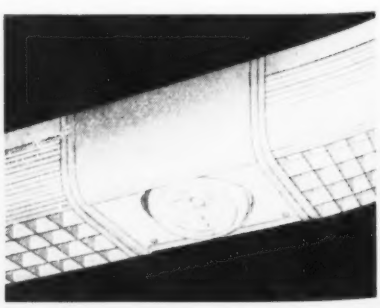
F Luminaire (1210)

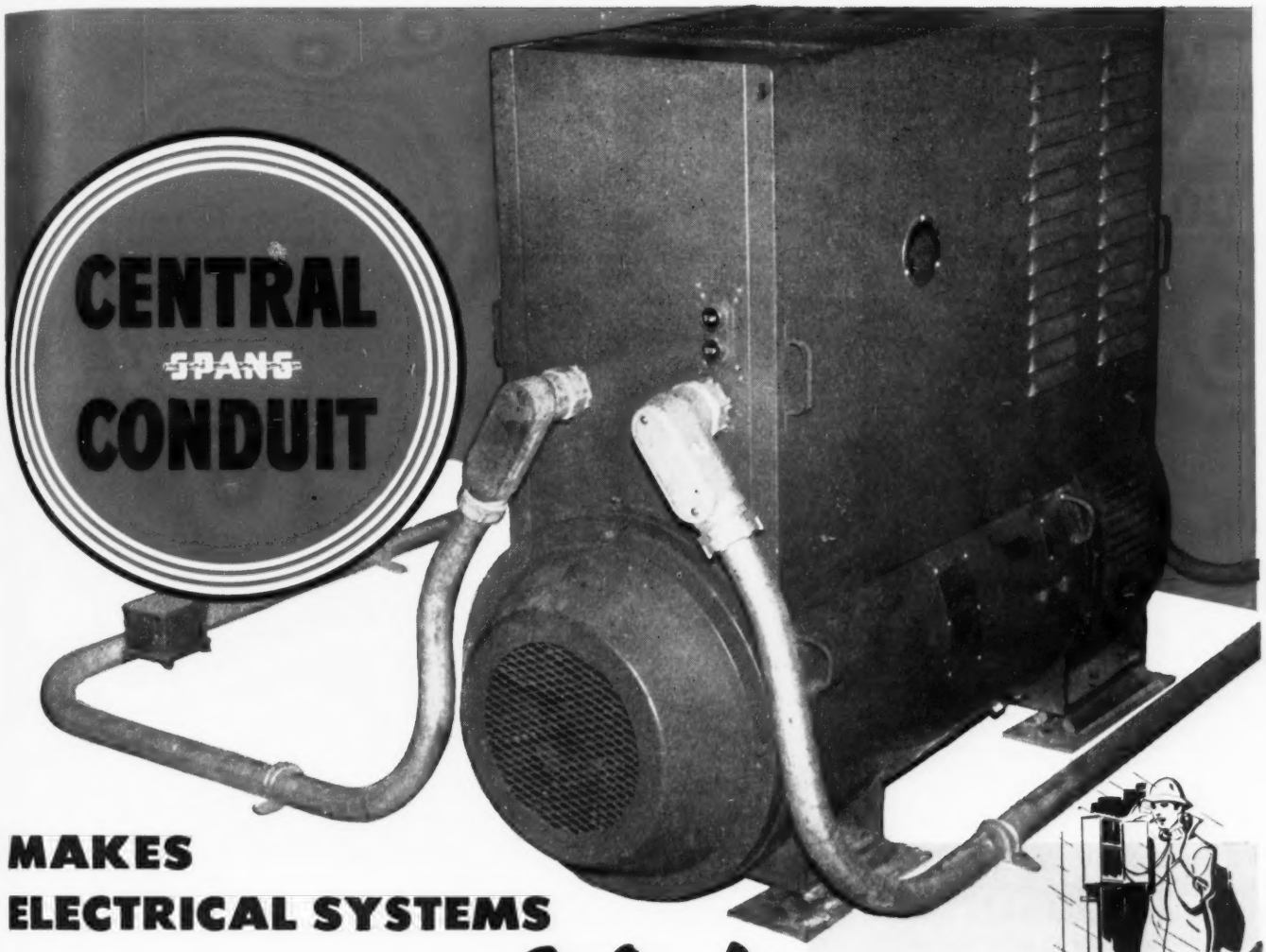
Smoot Holman is offering the Zenith, a fluorescent luminaire with polystyrene plastic side panels, ribbed to permit proper light distribution while reducing surface brightness to a minimum. Certified ballasts and starters are included. This luminaire may be installed individually or in continuous mounting. A two-piece aluminum louver is used for rigidity in shielding. Slope of side panels and open-louver bottom minimizes dirt accumulation. The enclosure is hinged on both sides for servicing.



Down Light (1211)

Pittsburgh Reflector Co. has a new downlight, Series A-178, which it is marketing under the name, The Dramatizer. It is designed to give "punch" lighting for spot displays, bulletins, maps, show cases, etc. Surface mounted individually or in line with fluorescent troffers, this light may be adjusted to swing in a complete circle up to 35° from its vertical axis. The newest type 150-watt, PAR-38 incandescent lamp with side-prong base is used.





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Here's why. Being rigid steel conduit it has more than twice the resistance to arcing and short circuiting of contained conductors than any other type of metal raceway. Central Conduit has durable coatings that offer good protection against the corrosive effects of weather and many chemicals. This popular Spang product is joined by accurately threaded couplings and fittings that assure moisture, vapor and dust tight joints. Consequently, it is approved by the National Electrical Code for use in hazardous locations and occupancies.

Central Conduit is sold by a distributor near you. Due to an unprecedented demand he may not be able to fill your order immediately. That's why it's important to place your requirements as far in advance as possible.

"There's Tested Strength in Every Length"

CENLACO a hot dipped galvanized and lacquered finish, inside and out.

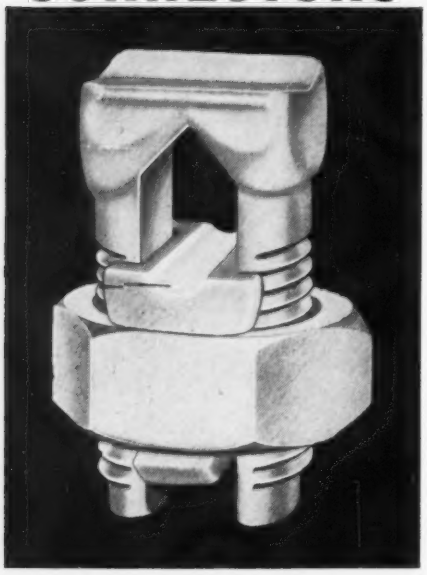
CENTRAL WHITE electro-galvanized outside and black enameled inside.

CENTRAL BLACK permanent, baked-on black enamel finish, inside and out.

• SPANG-CHALFANT

Division of The National Supply Company
General Sales Office: Grant Bldg., Pittsburgh 30, Penna.
District Offices and Sales Representatives in Principal Cities

MATTHEWS NUTYPE CONNECTORS



High strength materials and close tolerances of all parts make these connectors exceptionally strong. They will accommodate two or more copper wires from 10 solid or smaller to 1000 MCM strand inclusive. Connectors up to 1/0 strand inclusive, have pure cold forged bolts and clamping jaws and nuts are of 98% copper content hard metal alloy. The 2/0 and 4/0 connectors have machined bolts and nuts of 95% copper content high tensile strength alloy. Connectors for 350 to 1000 MCM strand are of cast hard durable alloy having high conductivity.

Plated connectors for aluminum or steel wires and with bimetallic washers for connection with copper wires are also available.

Nut retainers can be furnished on connectors for 6 solid wire to 1/0 strand inclusive.

Write for Bulletin 206

W. N. MATTHEWS CORP.
3722 FOREST PARK BLVD.
ST. LOUIS 8, MO.

BULLETINS ETC.

Instrument Catalog (1212)

A new electrical instrument catalog has been published by Roller-Smith. Sections include panel instruments, switchboard instruments, portable instruments, precision balances and accessories.

Space Heating (1213)

For the space-heater salesman Markel Electric Products has produced a booklet, "A Guide to Quick Heating," giving facts on its Fan-Flo Heetaire.

Lighting Catalog (1214)

Lightolier, Inc., has issued an 80-page spiral-bound catalog. In addition to photographs of individual units, the book includes 12 room settings showing the merchandise in use. Selling points on each piece of merchandise have been included in the copy.

Light Distribution (1215)

In a new catalog, Solar Light Mfg. Co. presents technical data and charts for determining light distribution and correct illumination.

Fittings (1216)

Gedney fittings are described in a 62-page booklet issued by the company as Bulletin 48.

Testing Equipment (1217)

General Electric is offering a catalog on its testing and measuring equipment.

V-Belt Selection (1218)

Allis-Chalmers' 144-page catalog, "Pre-Engineered Texrope Drives," is designed to simplify selection for persons untrained in V-belt engineering.

Connectors (1219)

"Connectors for Grounding" is the title of Catalog G 47 published by Burndy Engineering Co. The catalog includes a discussion of modern grounding practice, in addition to data on company products.

Contactor (1220)

Ward Leonard has a bulletin describing its new Size 1 a-c solenoid contactor, first in a complete new line of Ward Leonard a-c control equipment.

Capacitors (1221)

Solar Capacitor Sales Corp. has issued a 1948 catalog of capacitors and radio noise filters for servicing radios and industrial electronic equipment.

Lighting Data Sheets (1222)

Data sheets on new lighting products have been issued by Swivelier Co., Inc.

Bearing Temperature (1223)

The Edison bearing temperature monitor is described in a new publication of the Thomas A. Edison instruments division.

Tape and Compound (1224)

B. F. Goodrich Co. has issued a catalog sheet describing its Two-in-One tape for weather sealing electrical splices, its friction tape and splicing compound.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

1200	1201	1202	1203	1204	1205	1206
1207	1208	1209	1210	1211	1212	1213
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1221	1222	1223	1224			

Name ..... Company* ..... Title* .....

Address .....

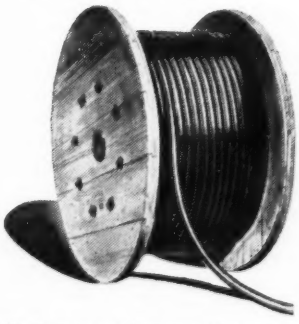
* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

Big Cable Tonnage

MEANS BIG SAVINGS WHEN YOU

FIGURE IT IN ALUMINUM

THE BIG DIFFERENCE IS IN YOUR COSTS!



*E. C.: Electrical Conductor Aluminum

Think of your cable requirements on a cost-per-ton basis. Then consider the fact that the weight of a 500-mcm insulated cable with Alcoa E. C.* Aluminum Conductor is less than half the weight of an identical copper cable.

Simple arithmetic will quickly show you some of the savings to expect when you "figure it in aluminum".

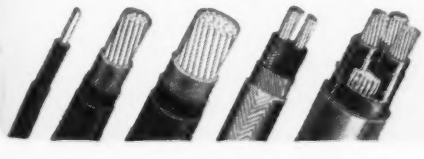
Aluminum wire and cable also reduce over-all wiring costs. They present:

NO PROBLEMS of Conductivity
NO PROBLEMS of Conduit Layout
NO PROBLEMS of Joints and Terminals
NO PROBLEMS of Availability

Your men will like the lighter weight of wire and cable made of Alcoa E. C. Aluminum. They're easier to handle and pull.

The advantage of "figuring it in aluminum" will accrue first to those utilities who are quickest to adapt aluminum to new or modernized distribution systems. Ask your wire and cable supplier, or write us for further information.

ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh 19, Pennsylvania.



ALCOA ALUMINUM

FOR ELECTRIC WIRE AND CABLE

ELECTRA'S HUSBAND

The Darndest Things

PEOPLE do the darndest things and yet live. Take electricity for instance. It has become so useful and so commonplace that we do some of the craziest things with it, and it's a wonder we don't get killed. Sometimes I have to admonish Electra, for she's kind of nice to have around and I'd hate to have electricity up and bite her. But she too will do some funny things with cords, including trying to fix them when they quit working, running them under rugs and through door frames.

But the best case of that kind heard of recently was told by T. R. Kivett, an electrical contractor in South Gate, Calif., to an electrical inspectors meeting. This is the way he tells it:

"A man came to my shop and asked if I would send a service man to his house to repair an electric heater. Ordinarily I pass up most of these calls but in this case agreed to help out the old gentleman.

"He lived in the rear bedroom of a house approximately six years old. Evidently he used it also for cooking and for a kind of workshop. A few of the items noticed were a 1,500-watt electric heater, a 660-watt toaster, a radio, electric clock, soldering iron all on one cube cap. All of these electric gadgets were connected to and fed from the wall convenience outlet. To my surprise the cord to the electric heater was passing through a porcelain pan half filled with water, on the floor.

"This cord was spliced together, was untaped, and was weighted down with a piece of sheet lead about three inches wide and four inches long, to keep the splice in the water.

"I inquired why the wire was running through the pan of water and he said that a year ago his niece, with whom he lives, had moved the table to clean the room and in doing so the table was moved on the cord and broke it in two. He had spliced the wires back together. They began to spark and he was afraid they would burn a hole in the rug, they were getting so hot, so he had put them in the pan of water and put the piece of lead on top to hold the splice under the water.

"Well this had been all right but it had burned out one of the receptacles in the duplex wall outlet. The old gentleman said that after he had spliced the wires and put them in the water every time he plugged the attachment plug into the receptacle the fire would shoot out of it, so he had devised a sort of 'hot stick.' The attachment plug was tied securely to the stick with a cord. The stick even had a sort of pistol grip on it to make it easier to hold and direct. With this stick, about two feet long, there was no danger of getting burned on the hands when he plugged in this load.

"Oddly enough, although the upper half of the receptacle was completely burned up and the lower half still operating, there were no fuses blown and no pennies or bridges behind the fuses. According to the man's story, he had never had to replace any fuses. There were 20-amp. fuses in the fuse block when I checked them. The set-up had been in use for more than a year. Previous to that he had used a receptacle on the opposite wall.

"The electric bill for this residence had been running nearly $40 every two months, according to the serving utility records."

But I'll bet the power company would just as soon not have very much of this kind of business. It is one of the darndest things that sometimes do happen in this never dull industry.

ANOTHER of those darndest things is the way we in the business will sometimes be the last to use our own stuff. This came home recently when after years and years of dictating to an old talking machine, not much different from that with which Thomas Edison began, a few of the new electronic machines were bought and put to use. The little electronic tube in its innards amplifies the sounds of the speaking voice enough to overcome the inertia of the wax and the sound that comes out of the typist's ear bears some resemblance to human speech.

One has to admit that human speech could be much improved too. Stenos complain most of those who are shy and do not talk loud enough to be heard. Well, since they won't sit on one's knees where even a whisper could be heard at its best, (neither Electra nor office conventions would permit that solution to the problem) the electronic recording machine, either on wax, plastic disc or tape, or wire is the answer.

This brings to mind the odd things that come back sometimes from a stenographer unfamiliar with the industry's jargon. An engineer, one day, blithely dictated away into a recording machine, forgetful that the girl was new. When the manuscript came back he was somewhat startled to read, "stark naked transformers." What on earth could he have said?

After thinking a minute it came to him—"star-connected transformers."

Kidding the girl about it, she came back with a perfectly logical reason. "Well, I didn't know what it was exactly, but you had just been talking about 'bare neutral', so I figured this was what the transformers were too."

DECEMBER, 1947 Vol. 99, No. 6

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Something New in Department Stores

at Bullock's—Pasadena

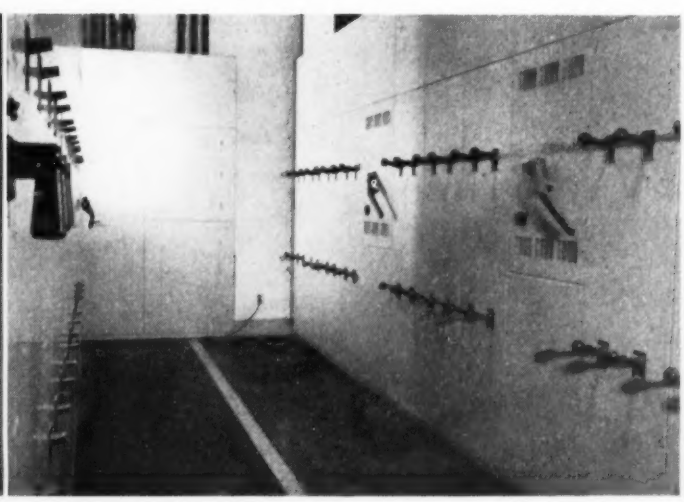
MORE like a swank country club in appearance than a department store, Bullock's — Pasadena, is something new in more things than one. It is new in looks, new in merchandising methods, and new in use of lighting and electricity. Completely heated and cooled electrically, its lighting, while inconspicuous in itself, is as perfect as the tasteful choice of colors, decoration and surroundings of which it is so inextricably a part.

Centered in an 8.2-acre plot between Lake and Hudson at Del Mar St. in Pasadena, away from the main downtown section, with parking for 600 cars, the store has 289,225 sq.ft. of space on three levels and a roof penthouse deck. Its low, ground-hugging building and its grounds were designed by Wurdeman and Becket, architects, with Paul Sessinghaus engineer in charge. Hilberg - Byler - Hengstler were its mechanical and electrical design engineers. P. J. Walker did the building. R. R. Jones Electric Co. of Pasadena made the electrical installation.

The lighting design was closely coordinated with the interior design by Raymond Dexter of Bullock's, by D. N. Herwit and the Solar Lighting Fixture Inc., which made the lighting equipment. Its air conditioning was installed by Western Air & Refrigeration Co. Store fixtures were made by Standard Cabinet Works.

Different also is the absence of the

Main switchboard room now contains almost double the amount of switchgear originally contemplated. Made by Benjamin Electric of Los Angeles, it uses Westinghouse Deion circuit breakers. Load connected comes from 1,200 hp. of motor load, more than 2,000 incandescent lamps, 25,000 fluorescent lamps, several banks of air heating fin strip heaters, sound and signal systems, etc. It is fed from the transformer vault adjacent to it by a 4,000-amp. bus. The transformers are General Electric, Pyranol filled, 500 kva., 2,400 to 240/120 volt, three of them for lighting, three for power. Main switchgear is G-E Magnablast, metal clad. To insure continuity of service, three separate sources of power are furnished by Pasadena City Light Department with automatic throw over in case of failure



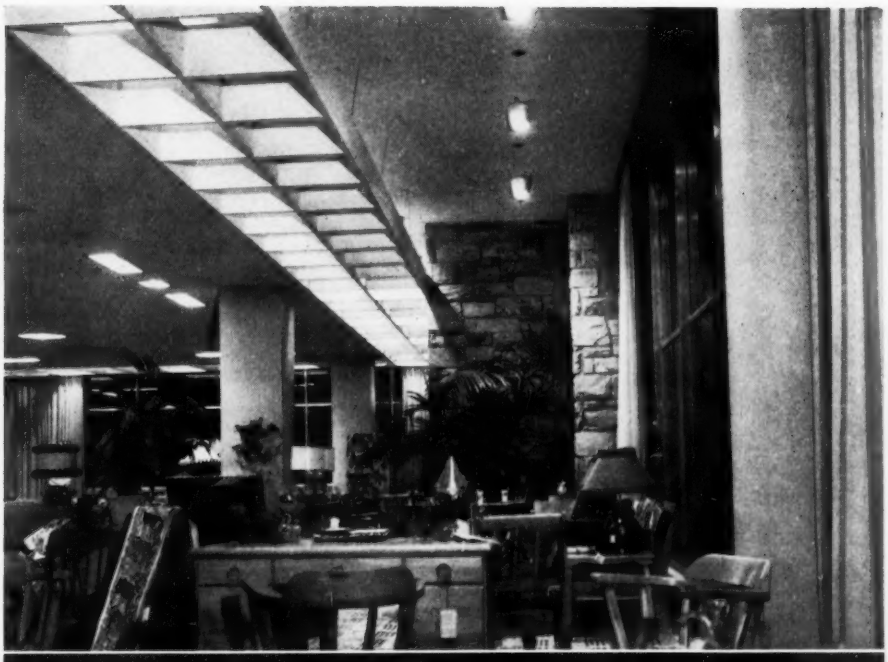
Executives may be reached unobtrusively, throughout the store, or even on the employees sun deck, as shown, by a

High ceiling cove seems to provide the light for the exotic entrance facing Toiletries section, but the illumination really comes from well - concealed sources. Down lights for the counters come through ceiling pin hole spots. The center fixtures, themselves of low brightness for ornamental appearance, conceal reflector lamps to cover walls

Mirrors repeat the lighting and the glittering display in the crystal room, where the cove (not lighted in this photo in order to show the ceiling down light and the location of the speaker unit of the sound system and access ports) provides general illumination and the glassware receives specular downlighting from the trough above the racks. In adjacent areas note the lighting of wall cases and the circular decorative ceiling units that are both cove and semi-indirect lighting. All pictures were taken without the use of flashlight to picture actual lighting

Vertical illumination on the wall cases in this part of the Collegienne shop is furnished from the slightly tilted troffers above them and away from the wall. All troffers are shielded. A soft glow of general illumination is supplied by the coves in the upper foreground and rear, and from cove and downlight circular fixtures in the center. The old oil lamps are sheer decoration contrast

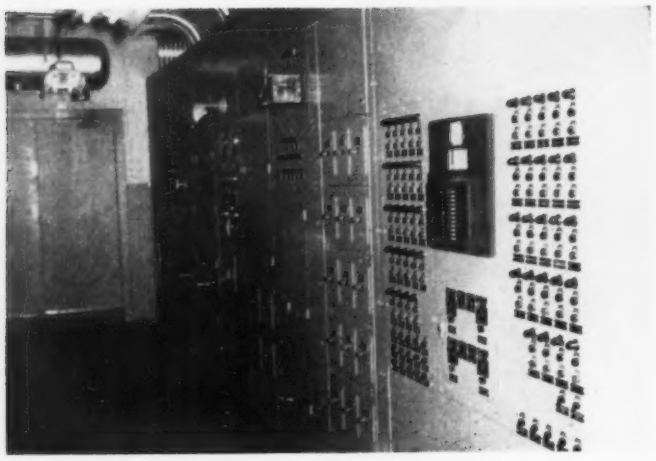
system of colored light signals. The sound system is piped to this as well as all areas of the store and grounds



The Sun Shop on the lower level with windows from ceiling to floor keeps its sun filled appearance regardless of outside weather. The ornamental modern louver in the center of the picture conceals spot and flood lamps to punch a beam or a flood of warm light on particular pieces of furniture. An added row of down floods is mounted near the window to make that area brighter than others as sunshine itself would make it. The large inner area is lighted with the typical interior pattern—two fluorescent units, set in the ceiling and covered with light directing glass, and a center incandescent built-in unit between gives warm light tones

Passageway between shops on the lower level (home furnishings), with low ceiling, makes effective use of a louver-all ceiling light box. Corner glass shelves illuminated from a glass diffused built-in unit. Circular down lights in ceiling of this store passageway are equipped with a fresnel lens plate

Home Store Gallery on the lower level which can be used for employee or educational meetings, exhibits or lectures for the public. Coves along each side and over the proscenium give various patterns of lighting through separate circuiting. The ceiling units reduce the high brightness contrast of the center down light by having a spill ring of lower brightness around it. This type of lighting is used in many other areas



usual show windows. Instead, certain areas, with glass for the entire wall, give an interior view from the street that makes that area itself a huge show window. Lighting for this was designed with the problem in mind. Conversely, to give the interior the effect of sunlight streaming in these windows, extra punch of light was installed near such windows. The view from the wall window areas (of Twindow glass for insulation) is often part of the decorative scheme of the interior.

Merchandising is intimate too. Related merchandise is arranged in adjoining areas, and in related designs or periods. Then there are walk-in stock rooms and set-up rooms in which the furniture and furnishings, drapery, etc., can be assembled to simulate a room in the home complete.

To light this with proper balance of fluorescent and incandescent sources was an individual design situation for each area. The full color range was provided by combinations of both fluorescent and incandescent lamps. Some 487 shades and tones of color were used in the decor of this colorful store.

Pictures on these pages indicate some of the lighting techniques employed. Others illustrate some of the electrical facilities of the extraordinary store designed to serve especially the people of Pasadena and the San Gabriel Valley.

Control board for the air conditioning system in the compressor room

One of the panelboard rooms in the riser shafts, of which there are four, each with panels for telephone, signal, power and lighting and many with emergency lighting in addition. Roy Holmes, superintendent for R. R. Jones, electrical contractor, is standing by

Lighting standards in the parking lots also contain public address speakers

Novelty in decorative effect is made possible around the center pillar of the Beauty Studio by means of Circline fluorescent lamps. A cold cathode custom tubing behind a valance lights the draperies of the circular studio booth grouping. Downlights furnish more light

Dramatic treatment of lighting fixtures to spot light the wall cases above the manicure table. Note the thermostats

DRAGGING IN THE YULE LOG—

Electric Transmission Linemen's Version

WRANGLING a 45-ft. transmission line pole over and through deep snow drifts in the Colorado Rockies is anything but a Christmas carol singing ceremony. It's a rugged chore!

The Public Service Co. of Colorado crew shown above had such a chore during a race with winter to complete a 2½-mile line extension to the summit of 11,400-ft. Berthoud Pass in time to put the world's first two-seat electric ski lift in operation by Christmas. Fifteen men were required to drag the pole to its location on the wintered slope of the Continental Divide.

Success of the undertaking is evidenced by the picture at right, which shows Eleanor Kentz, Public Service Co. employee (left) and Genevieve Grover taking the first ride when the tow was placed in operation in early December. The ski course formerly was served by a gas-powered rope tow.

Difficulties encountered in extending the line included clearing of a broad pathway for setting the poles and stringing the wire. Many big trees had to be felled in such a way as not to obstruct the course of the line. And swinging a heavy axe into the trunk of a huge pine tree is no easy task in the rarified air at an altitude of two miles.

The construction crew used its specially built snow jeep to deliver supplies and materials to the remote area.

The snow jeep, a caterpillar tractor on skis, is used for winter line patrol.

Approximately 3,000 ft. of the line extension goes almost straight up to reach the top of the mountain. A transformer, poles, heavy coils of copper and other weighty materials had to be skidded and tugged to this point. Holes had to be blasted expertly in solid rock and frozen ground so that there would be holes, not merely excavations that would have to be filled in to insure solid footings for the poles.

The power company furnishes its men, who work in the rugged mountain areas, with all possible comforts and conveniences. These include made-to-order trucks with cabs so constructed that a half dozen men may warm their feet and hands, thaw frozen boot and gloves by means of built-in hot air blowers.

The dual-chair lifts, designed and built in Denver by the Heron Engineering Co., are suspended on one cable and pulled by another powered by a 50-hp. motor. Five hundred skiers an hour can be accommodated.

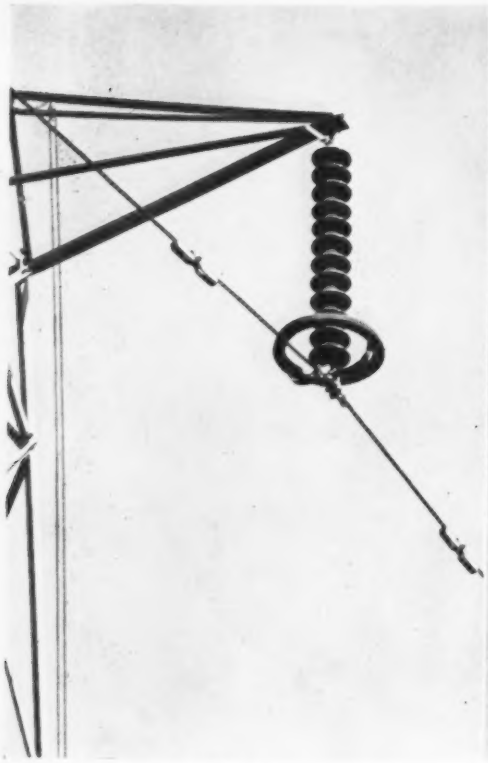


Fig. 1

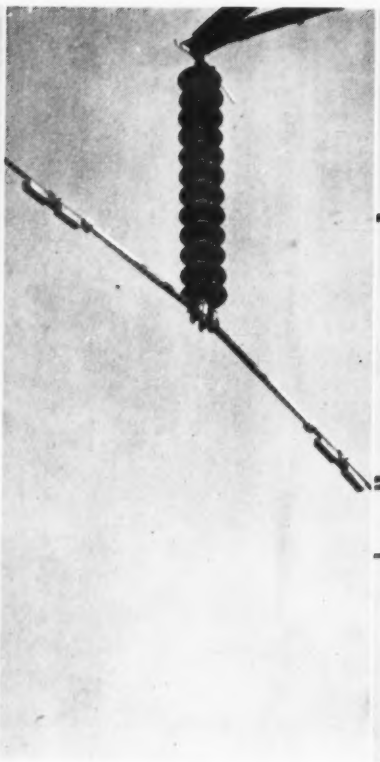


Fig. 2

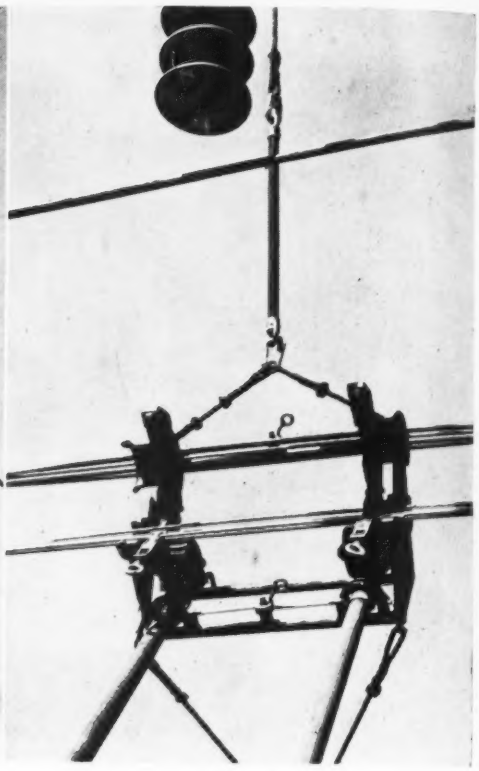
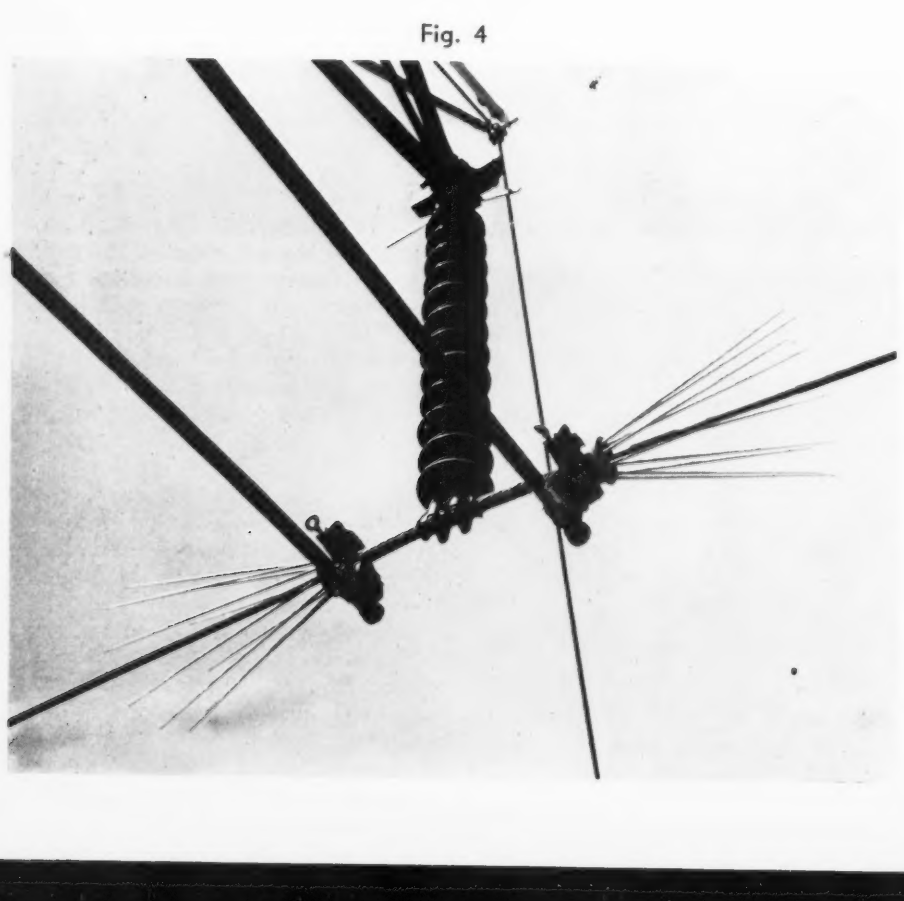


Fig. 3

NEW TOOLS ARMOR ROD 220 KV. HOT

Used in two rehabilitation program on Edison's pioneer Big Creek lines

Fig. 4



ARMOR rodding of energized conductors for added strength and protection is an important part of the first major rehabilitation since 1925 on Southern California Edison's pioneer 220-kv Big Creek lines. Use of special hot-line tools originally developed by H. A. Crowley of the City of San Francisco has made it possible to perform with comparative ease the intricate operations illustrated. A crew of twelve men plus a foreman and truck driver is able to complete four towers per day. This includes megger test of insulators, inspection and neces-

Fig. 1, 2—Before and after armor rodding of conductor on So. Calif. Edison's pioneer 220-kv. Big Creek lines

Fig. 3—Special tool developed for hot-line armor rodding. Worm-driven split disks wrap aluminum rods on conductor

Fig. 4—Close-up of winding operation. Insulated wood shafts drive worm gears in opposite directions for tight spiral

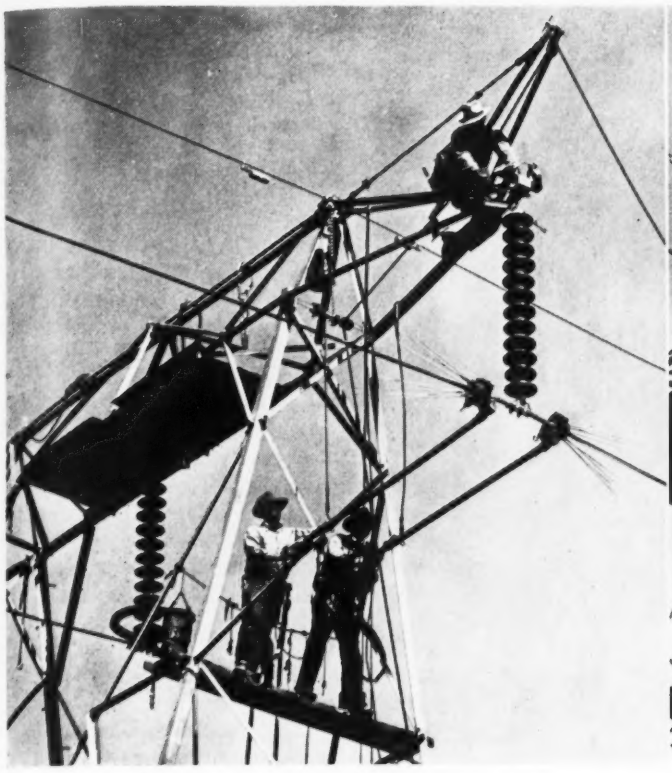


Fig. 5

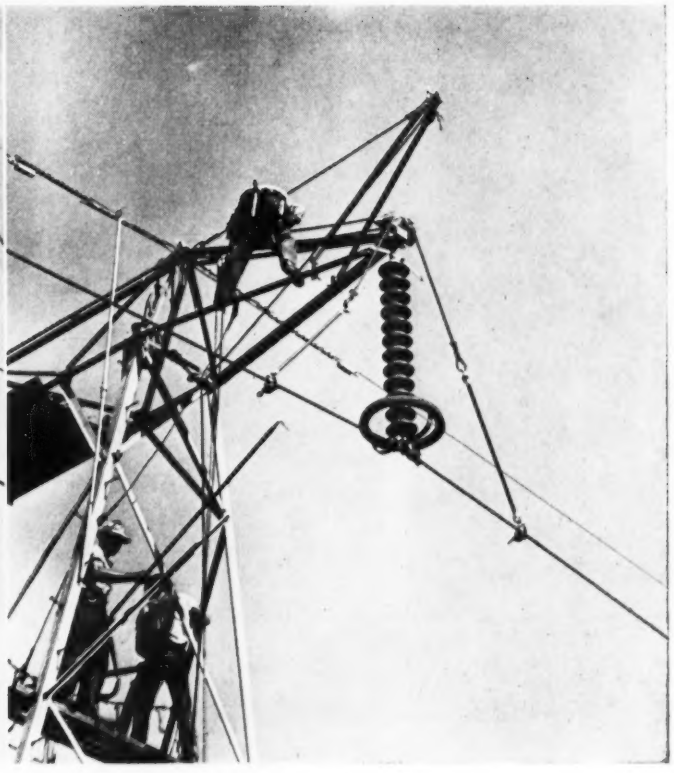


Fig. 6

sary replacement of all suspension hardware, installation of new low-loss aluminum clamps, removal of old static rings and respacing of Stockridge dampers.

Special tool used to install the armor rods (Fig. 3) is made up of two worm driven disks with ten equally spaced holes. The 99-in. armor rods are placed through these holes, forming a long slim squirrel cage with overhanging ends. These disks are split into two halves and hinged as shown so they may be placed around the conductor, clamped together and the cradle assembly removed. To wind the rods around the conductor two ordinary electric hand drills drive the worm gears through an insulating wooden shaft (Fig. 4, 5). Power for the drills is furnished from a 1,500-watt, 115-volt gas-driven generating unit mounted on the line truck.

A special tool is used to install the button clamps which secure the ends of the armor rods. For positive thread starting it has a spring-loaded tapered male guide to engage the hollow ended Allen screw which holds the clamp. Job is completed by respacing the Stockridge dampers for more effective damping. Armor rod eliminates about 40% of mechanical vibration, dampers the balance.

In rigging the hot line to free the insulator for inspection and replacement of hardware all stress is taken by two sheaves mounted directly on the tower arm (Fig. 6). Gin pole serves only to keep treated hand line away from energized conductor. In addition to the special tools a wide variety of more standard hot-line tools is carried in the well-equipped line truck (Fig. 7).

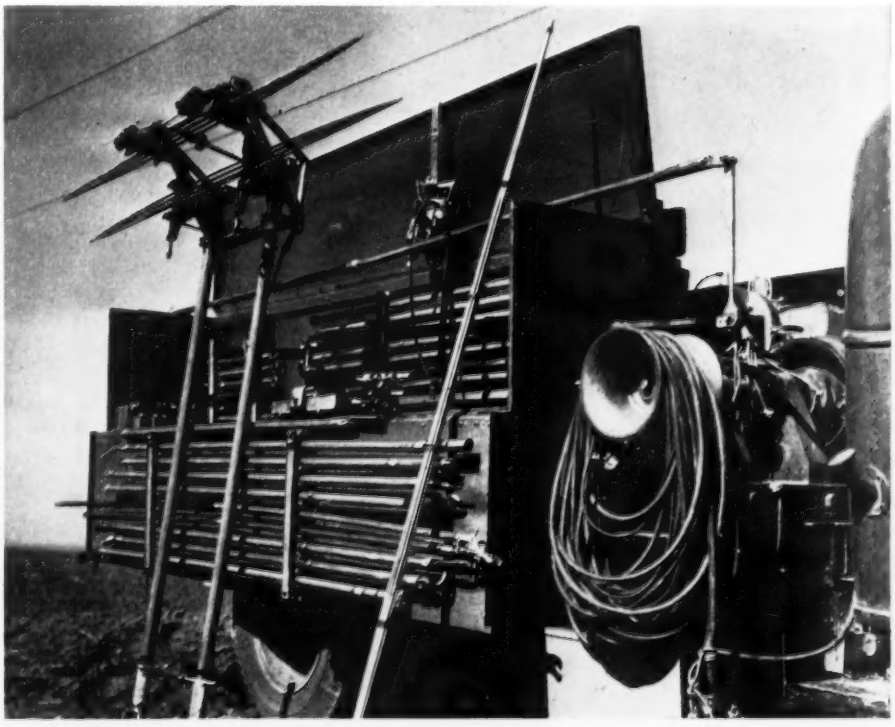
Excellent progress of the job, scheduled to require about two years, has been made possible by use of tools and methods described.

Fig. 5—Tool is driven by two electric drills, power supplied by gas-driven generating unit mounted on line truck

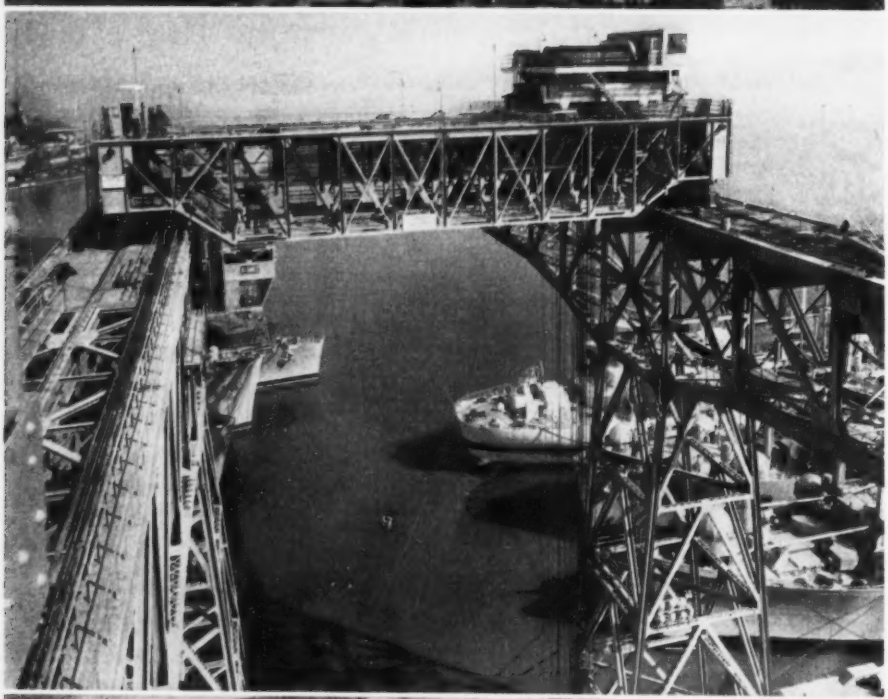
Fig. 6—Method of rigging conductor to free insulator. Stress is taken by two sheaves mounted directly on tower arm

Fig. 7—Line truck carries wide variety of standard hot-line tools supplementing special tools required for this job

Fig. 7



GIANT TO LIFT



THE World's largest crane capable of lifting 500 tons, or the entire gun turret off a battleship, is now in operation at San Francisco Naval Shipyard, Hunter's Point. A wartime project, the huge crane was built to speed repairs to naval craft. It consists of stationary parallel bridge structures as shown, on which two cross bridge structures travel. Total length of the stationary structure is 730 ft. with 162-ft. overhang out over the bay at each end. Height of rails is 176 ft. above the wharf and 182 ft. above the water. Clearance between wharf and underside of center arches is such that a 15-story office building could be set under the crane, so massive is it.

Each crane is equipped with a single trolley carrying a main hook and an auxiliary hook. The main hook has a rated capacity of 225 long tons (250 short tons) at 10 ft. per minute hoisting speed, while the auxiliary hook has a rated capacity of 50 long tons at 30 ft. per minute. Both hoists will be tested under 125% load.

For handling loads in excess of 225 long tons, provision is made for tandom operation by coupling the two cranes together with standard railway couplers. As far as bridge propulsion is concerned, the two cranes then function as a single crane. An equalizer beam with a giant double-barbed swivel hook in its center is suspended from the two main hooks, giving a combined rated hoist capacity of 450 long tons at 10 ft. per minute.

Weight of each crane, complete with trolley and rated pay load of 225 long

One end of huge crane showing the two cross bridges. Maximum lift of 500 tons is obtained by coupling the two bridges together and using equalizer beam between two main hoist blocks

View from one bridge to the other gives some conception of height and massiveness of structure. Cantilever extends 162 ft. over bay; rails for bridge are 176 ft. above wharf and 182 ft. above water. Hoist works at end

Main hoist drums showing the two 135 hp., mill type d-c driving motors. Cross flux control gives hook speeds inversely proportional to load. Hook speeds range from 10 to 30 ft. per minute

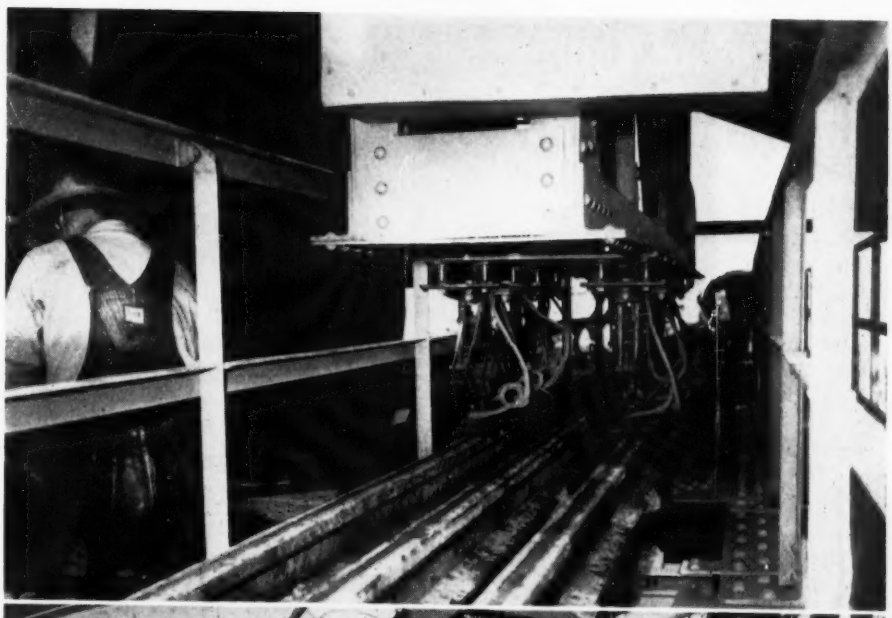
CRANE 500 TONS

tons is approximately 1,734,000 lb. During tandem operation with beam and 450 long ton load, total weight will be 3,568,000 lb. or 1,784 short tons.

Cable capacities of hoist drums will be sufficient to allow vertical operation of main hooks through 185 ft. from 25 ft. below water to 160 ft. above.

Power is supplied over two 12-kv. cables to a 1,000-kva. dry-type transformer bank located part way up the leg of one structure. Secondaries at 480 volts feed three railroad contact rails with sliding shoe pickup to the two bridges, as shown. Pertinent data on the General Electric drive equipment follows: travel motors on bridge—four 50-hp., 480-volt wound rotor induction motors on each; three-unit motor-generator set on each bridge — 400-hp. squirrel cage motor driving two 125-kw., 230-volt d-c generators and a 20-kw. cross flux exciter; main hoist motors, one on each of the four cable drums—135 hp. mill-type d-c motors; travel motor for hoist structure—one 50-hp. wound rotor motor on each; drive is equipped for regenerative braking and provided with General Electric Maxspeed or cross flux control.

One of the most interesting electrical features of the crane is the cross flux control by virtue of which speed of the hook is inversely proportional to the load. This makes possible a great saving in time with empty or lightly loaded hook. Some of the electrical equipment described is highlighted in the accompanying staff photographs, taken during preparations for initial tests.



Railroad rails with sliding shoe contacts carry 480-volt a-c power from 1,000-kva. dry-type transformer bank to distribution cab on movable cross bridge for travel motors and m-g set

Three-unit motor-generator set for supplying d-c to hoist motors consists of 480-volt induction motor driving two 125-kw., 230-volt, d-c generators. Motor also drives 20-kw. cross flux exciter used in G-E's Maxspeed control

Operator uses microphone and loud speaker in control cab to maintain contact with walkie-talkie set below. Red and green lights automatically show when cranes are lifting in unison

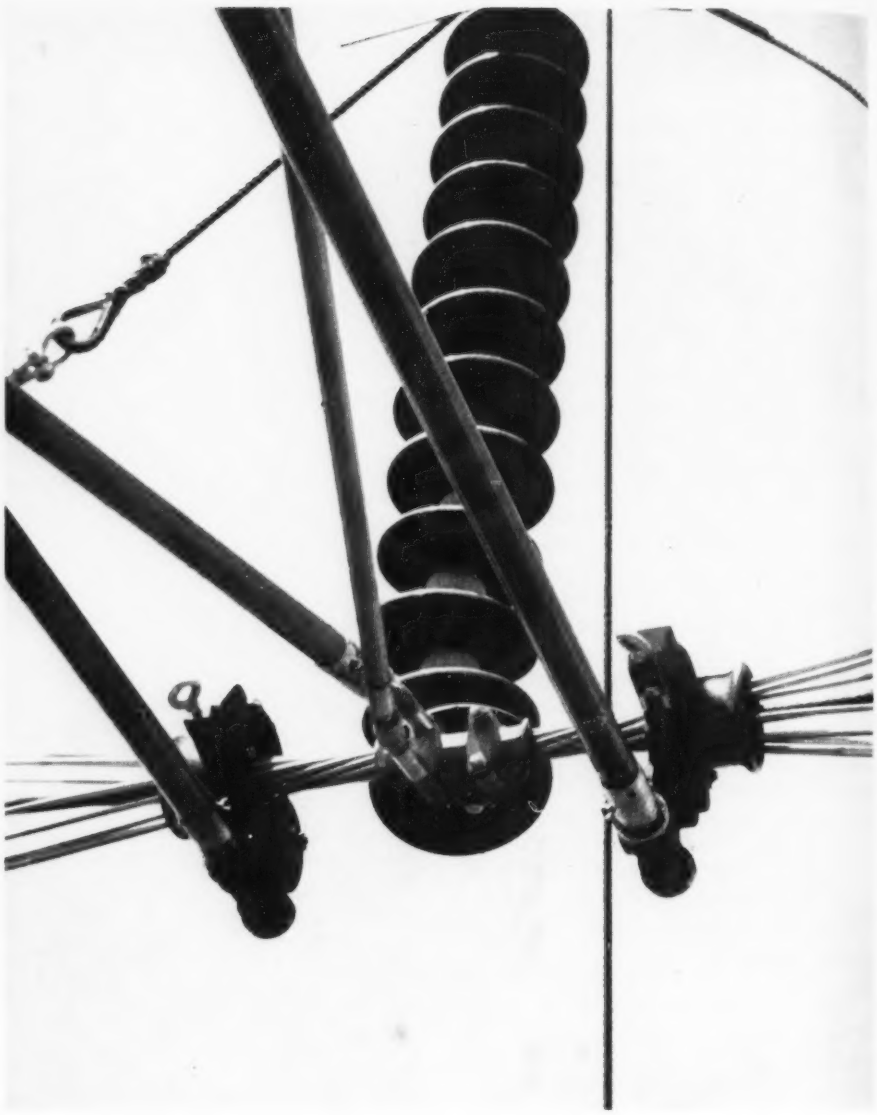
Aluminum Clamps Cut Magnetic Losses

Difficulties in securing conventional malleable iron clamps for supporting transmission conductors has led to the use of aluminum clamps by some utilities and to the discovery that magnetic losses can be reduced from around 26 watts per clamp to a fraction of a watt. Southern California Edison Co. is now using aluminum clamps as shown in connection with the armor rodding of its two 220-kv. Big Creek lines. At a saving of 25 watts loss per clamp, annual power savings amount to about $1 per year per clamp. Suspension clamp loss tests conducted by the Los Angeles Department of Water & Power recently were quite revealing, particularly as regards loss on two makes of aluminum clamps. Tests indicated losses reduced to almost nil as shown by the table below:

Type of clamp	Line Amp.	Watts Loss
O. B. 78676	300	26.4
O. B. 70701	300	18.6
O. B. 85469	300	8.7
W. D. Howze & Co.*	300	0.6
O. B. 85658*	300	0.3
Boulder HH clamp	300	9.0

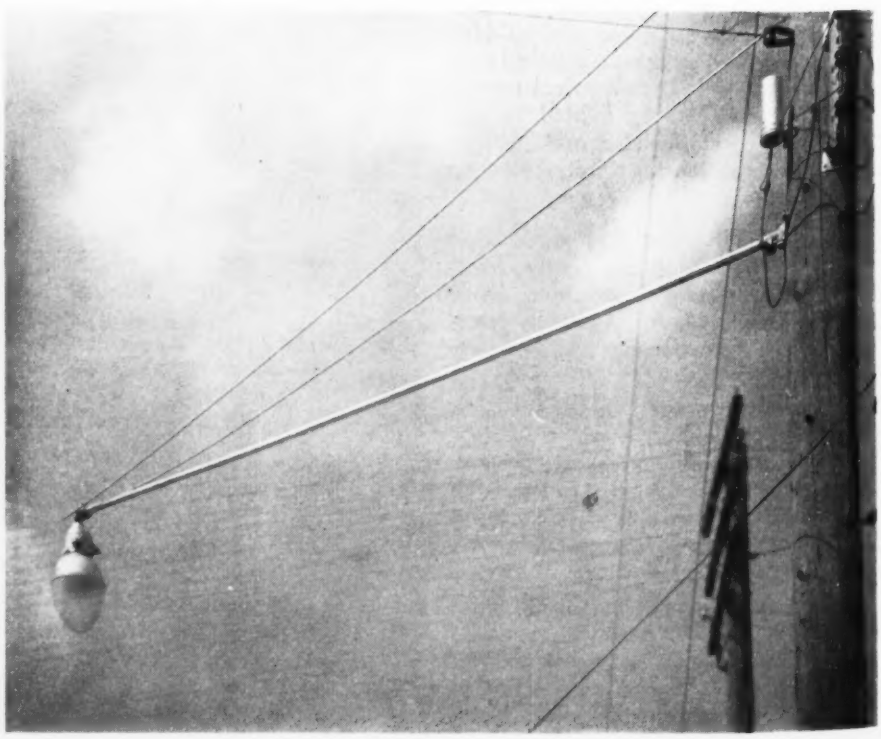
*Aluminum clamp

Aluminum suspension clamps are now being made by at least two manufacturers, W. D. Howze Co. of Los Angeles and the Ohio Brass Co.



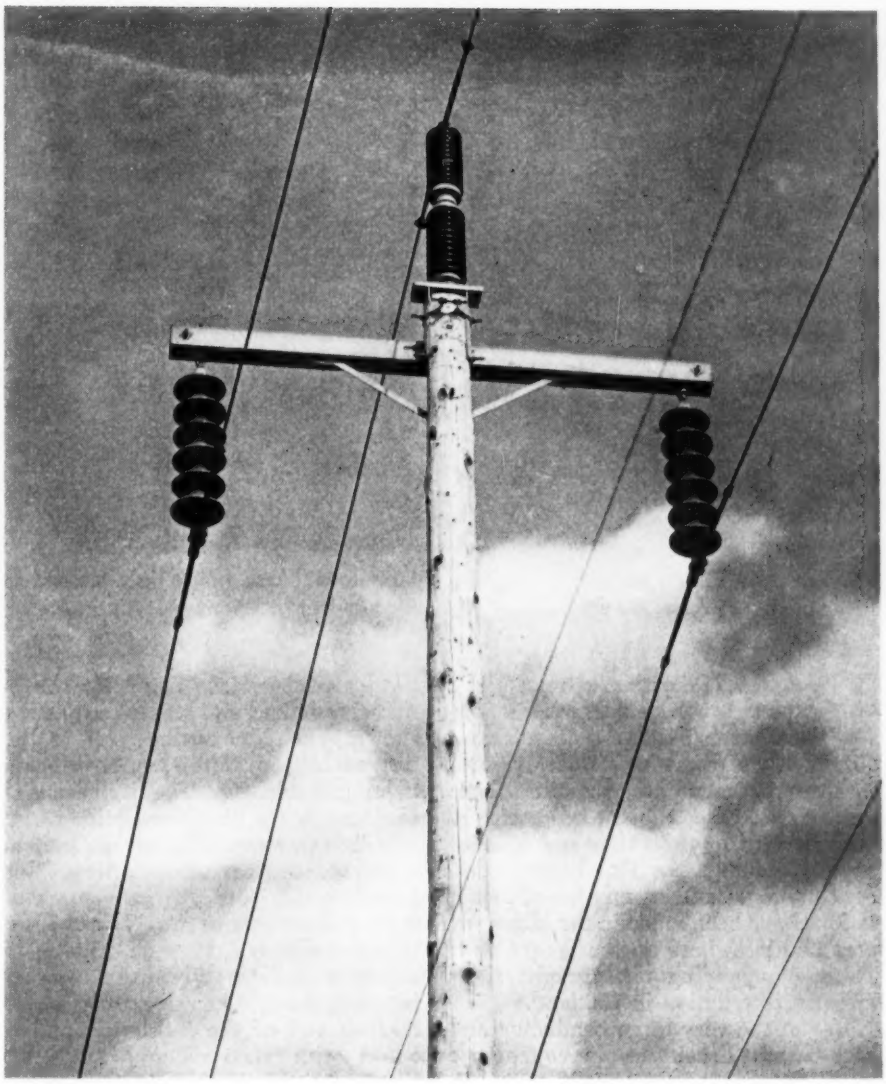
Street Light Control

Solution to the problem of controlling street lights at highway intersections in suburban areas has been found to the satisfaction of the Washington Water Power Co., in the photoelectric device shown. The switch, called Sunswitch, made by the Ripley Co. has a capacity of 15 amp. at 110 volts. An electric eye set to point to the north actuates a contactor to turn lights off and on at dawn and darkness. This utility has more than 200 such controls and finds that at their low cost it pays to install a photoswitch if more than 360 ft. of switch wire is required to reach a controlled circuit. Trouble with time switches formerly used was the high operating cost of resetting them for seasonal changes and after interruptions to service.



Streamlining For Appearance

Many situations arise where a utility wishes to make an urban transmission line as inconspicuous as possible. The Washington Water Power Co. has developed the unusual pole top design shown for the purpose of streamlining 110-kv. transmission lines in such cases. Triangular configuration was made possible at 110 kv. by use of two 60-kv. Ohio Brass post-type insulators flanged together as a single unit. Conductor is 4/0 ACSR. Wishbone construction and the type using two full-length arms were discarded as alternates from the standpoint of appearance.

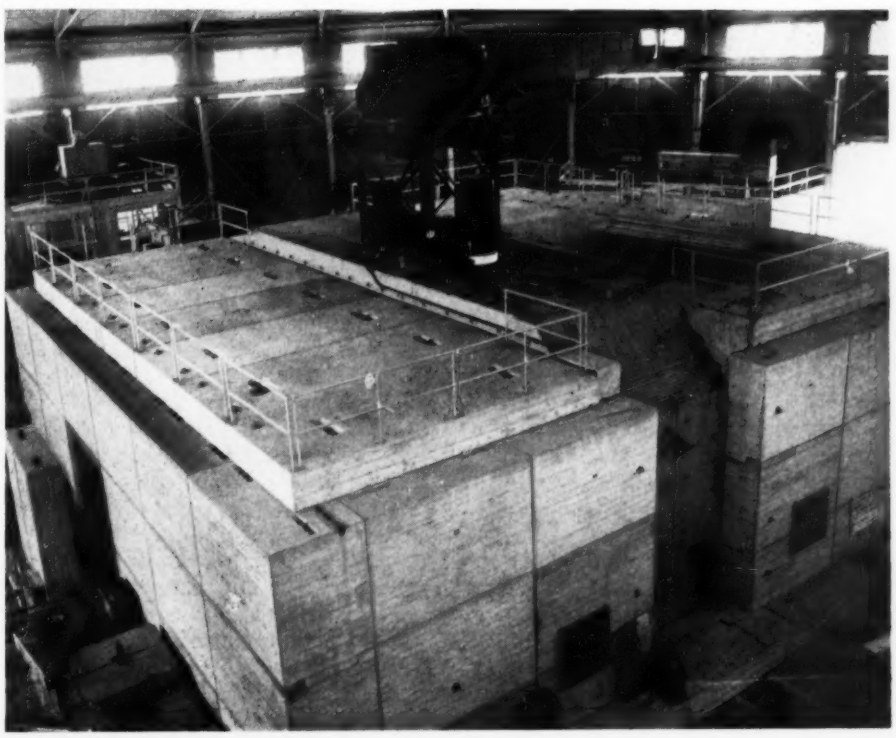


Concrete Shields New Cyclotron

Protection of personnel against dangerous radiation of the 4,000-ton cyclotron of the University of California required some 2,000 tons of concrete to build the enclosing wall shown. Primary purpose of the wall is to protect workers from 100 million electron volt neutrons produced during operation of the new atom smasher.

Research on a number of elements to determine the most effective shielding was done under auspices of the Atomic Energy Commission in collaboration with the University's Radiation Laboratory. Dr. B. J. Moyer, physicist of the Radiation Laboratory in charge of the investigation, found that a low atomic number and high density was the desirable combination of factors for most effective shielding. Under such circumstances the nuclear particles of a protective substance are crowded together close enough to increase materially the frequency with which neutrons will be stopped. Water, paraffine, graphite, aluminum and lead were all less effective than concrete. Copper was more effective, but impractical because of cost.

As a result concrete was used in blocks five feet wide, five feet thick and ten feet long. This cuts radiation down to one one-hundredth its original strength, which gives sufficient protection at present beam intensities. As beam intensity is increased in the future, it will be necessary to increase thickness of the concrete to eight and eventually ten feet.



Electrical West—Vol. 99, No. 6

Low-Voltage, High-Current, Radiant Heat

Ruben S. Tice

Concrete block house in Oakland being electrically heated with low-voltage, high-current radiant electric heating. Six-room house contains 1,400 square feet

RADIANT heating using a ½-in. plough steel cable with a low-voltage, high-current transformer is one of the latest developments in radiant electric house heating. This system called Electradiant was designed and patented by the writer and is made by his company, the Tice Electric Co., of Monterey, Calif. A number of installations have been made in the Monterey area and elsewhere on the West Coast. The accompanying photographs show a recent installation in Oakland.

Use of the very large conductor and high-current density at low voltage are its distinguishing features. The ½-in. plough steel rope cable insures complete freedom from mechanical troubles and future maintenance. Also, the ease and speed with which it may be installed is a big factor. Installation cost is about 70 cents per square foot of house area. Another advantage is that by matching the transformer secondary voltage to the exact length of cable in a run, the cable may be laid in one continuous piece for several rooms. For a six-room house there usually are not more than two circuits and two transformers. Although there is a loss of a few per cent in the transformer, this is not a disadvantage because the heat loss in the transformer is radiated directly into the room and is fully utilized.

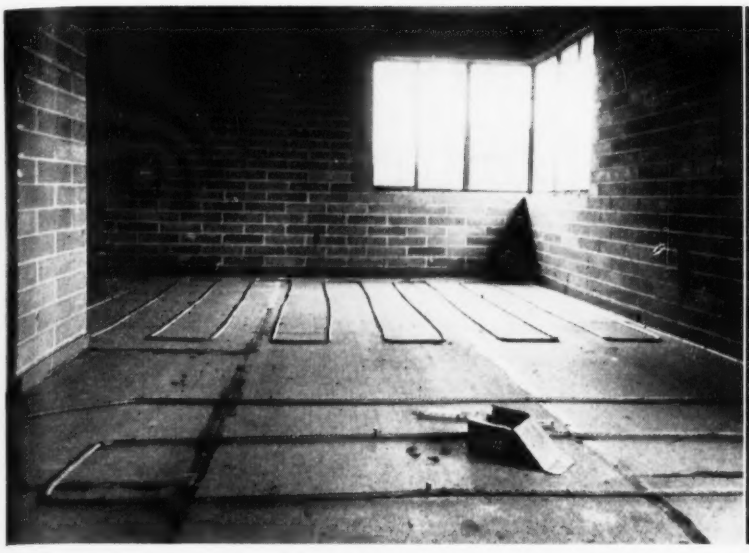
In developing the system, tests proved that a ½-in. wire rope, Bethlehem processed and distributed locally by Bethlehem Pacific Coast Steel Corp., had the most satisfactory characteristics for the high-current, low-voltage principle used. The cable is either buried in a concrete slab or placed in a built-up wood floor. In the former, a 4-in. concrete slab is first poured. On this, in the Oakland house, is placed a covering of ½-in. Celotex with the hard glazed surface up. Then the ½-in. cable is laid and stapled in place as shown. The 2-in. surface slab is then poured on top of this, embedding the heating cable. Other installations in concrete floors have used 4 in. of vermiculate concrete in place of Celotex.

In wood floor installations, floor joist is laid 2½ to 3½ in. below what would be the normal floor level. Wooden sleepers are then laid on the sub-floor and glass fiber insulation laid between these. The wire rope is then laid on top of the insulation and secured with glass fiber lined straps. Clean, dry, beach sand is then applied to cover the cable fastenings to a depth of not less than an inch. The wood floor is then laid. Different floor coverings such as asphalt, cork, linoleum or carpets can be used without adversely affecting radiation. Wood floor installations have proved remarkably successful.

Resistance of the cable is such that one volt impressed on 9 cu. ft. of cable will cause a current of 125 amp. to flow. Uniformity of resistance is insured by the special care used by Bethlehem in alloying the steel for this particular cable. This is important as otherwise resistance might vary as much as 25%. The cable is laid in a grid as shown with a spacing normally of 1 ft. Wattage per square foot may be varied at will. Usually it is made higher near windows to compensate for the greater loss at such exposures. Normal density is 10 to 15 watts per square foot. It works out that there is about one lineal foot of cable per square foot of floor area to give wattage densities of this order.

Maximum operating temperature of the cable is 120°F. Normally it operates at about 110°. This low operating temperature of the conductor is important since it has much to do with the effectiveness and efficiency of radiant heating. In systems using small resistance wire the conductor operates at very much higher temperatures. In the Electradiant system a special thermostat in contact with the cable at one of the terminals insures that a cable temperature of 120° will not be exceeded. Floor temperature runs 70 to 74°. Wall thermostats sensitive to one-tenth of one degree provide for temperature control. In some installations a zone control system has been incorporated

Inserting thermostat in porcelain bushing. Thermostat in direct contact with cable serves to limit maximum temperature of wire itself to 120 degrees



Heating element (left) consists of 1/2-in. plough steel cable. Laying of element (right) is simple operation. BX stapels are used to hold cable on Celotex pad until final concrete floor is poured. Whole job takes about three hours

to limit demand on the power system.

Secondary transformer voltage ranges from 20 to 70 volts depending upon the length of cable in a circuit. In the Oakland house pictured there are two circuits and two transformers. One circuit covers the three bedrooms, bath and hallway and is 480 ft. in length. The other, 580 ft. long, covers the living room, dining room and the kitchen. Transformers are conveniently located in an out-of-the-way place as shown. These are fed from a 240-volt circuit. "Off" and "on" switching is done in the primary or 240-volt side of the transformer by a thermostat actuated contactor.

Advantages of the system are mechanical strength and ease of installation, as mentioned. With the large cable, mechanical or electrical failure are practically impossible. Two men can install the cable in a 1,200-sq. ft. house in little more than three hours. Additional advantages are that circuit runs do not have to be made to exact length as they do with smaller resistance wire operating directly off 120 volts and requiring a number of circuits and outlets; the greater surface and low temperature of the large cable is a much more effective radiating medium than smaller wires. Besides, of course, this system in common with all radiant heating systems in the floor, gives equal comfort at lower temperatures than with other systems, energy consumption is less, temperature gradients between floor and ceiling are very low, there are no cold spots, and the user experiences a high degree of satisfaction with his heating system.

Wood floor installation (left) showing how heating cable is embedded in glass fiber insulation and then covered with sand. Dry-type transformer (right) feeds heating circuit. Primary is fed from 240-volt circuit. Secondary voltage is made to suit exact length of cable in a particular run. Voltage may range from 20 volts to 70 volts, depending upon length, to cause the design current of 125 amp. to flow. Thermostat actuated contactor above the transformer

MORE PRODUCTION IS THE ANSWER— How Can We Get It in Contracting?

Charles A. Langlais

Electrical Contractor, San Francisco

While others in various branches of the industry told of efforts to keep the high cost of construction down by improved productivity in manufacturing, distribution and deliveries, the really practical talk on production at the convention of the National Electrical Contractors Assn., in San Francisco recently, was delivered by a successful and resourceful electrical contractor of San Francisco, Charles Langlais. His talk, he announced, was aided by thoughts submitted to him by Herman Wilson of Washington, D. C., and Oliver F. Burnett of Chicago. Although it was reprinted by NECA for its members, it is worthwhile giving it a wider reading in the West among contractors, inspectors, wholesalers, manufacturers and utility engineers, consulting engineers and architects who read Electrical West. Following this convention paper, in future issues, Electrical West will describe the foremen's meetings that the Charles A. Langlais Co. conducts and present for the industry's wider use the papers that were prepared and discussed at these foremen's meetings. They can be used by other contractors as a text for similar meetings and classes of instruction.

PRODUCTION problems are a part of our business. Therefore we must face them and take care of them.

We are a part of the construction industry and, as such, must keep in balance with that industry. We, as well as every other part of the construction industry, must shed our war-born coat and get into our peacetime overalls. We must contribute our part toward stabilizing the construction industry. We must do it electrically. We cannot and do not want the plumber, the painter or the general contractor to try to stabilize our part of the construction industry. This business belongs to the people who are in it, namely, the contractor and his employees. If they take care of their business, their business will take care of them.

It would seem to me that from a contractor's point of view, the subject of production problems has two principal divisions — first, the physical or mechanics of handling the job, and second, to produce the job at a cost that will advance our industry, rather than retard it.

These two divisions are so closely interrelated, that for the purpose of this discussion it seems necessary to treat them together.

Material, labor, job expense and overhead are the components of cost before a profit is determined, and our big production problem today is the high cost of all of these items. It is a most serious problem because the high cost of them threatens to dry up demand.

We don't make the material, we install it. If the flow of material is not constant, labor is retarded, job morale drops, costs go up. That condition exists today and must be considered in any lump sum estimate.

It is that thing called *contingency* that causes lump-sum estimates to be high.

One recently prominent contingency has been the escalator clause, which can have no other effect than to cause prices to rise. We say to the manufacturers and jobbers "this is your problem," for we certainly are going to fight against the return of the escalator clause.

Then, there is the problem of normal flow of material to a job. I would like to stress the point, that the lack of normal flow of materials is one of the worst causes of unnatural expense, and until our suppliers can fill our orders promptly, will continue to add to our cost of doing business.

It does this to us:

1. We get a job rolling, the tempo is up, everything is going reasonably well. A material shortage develops. The job stops. The tempo is gone. It takes a supreme effort to get it going again.

2. Our purchasing costs are out of all reason. We shop for materials here and there. We get a little from this jobber and that jobber at short quantity price.

3. Our job expense goes up. We have to pick up and deliver if we are pressed for time. We cannot buy for the job as we should.

4. Our overhead goes up. We have multiplicity of purchase orders and invoices—all of which must be checked, causing more office expense. We do not get exactly the material we want at the time we want it, causing our labor costs to mount.

All of this goes into the price of a lump-sum job. It is one of the larger contributing causes. Probably the greatest single cause for high prices in the contracting industry has been and will continue to be the inability to marry men, material and time efficiently to do a job. When we get the material, the men are busy elsewhere. This will continue just as long as the flow of material is irregular.

5. Selling directly to the consumer. This practice should be discouraged with every means at our disposal. It produces a lack of coordination where materials are purchased elsewhere. A contractor must put in a contingency to take care of deliveries which he does not control. It creates an additional burden on all concerned, and in the end defeats any apparent savings.

Lately some suppliers have taken a leaf out of the liquor vendor's book. The liquor dealer made a customer take a case of rum with a case of Scotch. Now some suppliers are asking contractors to take material that the supplier is long on, and the price is dropping, before they will favor him with a supply of conduit.

There is a great shortage of skilled labor. What are we doing about it? We are training apprentices, it is true, but are we training enough of them?

It seems to me that in view of facts, our friends in the IBEW should foster and further the apprenticeship training plan to its utmost. We do not and will not have the men to do the job that has to be done in the next five to ten years, if we don't foster and promote this apprenticeship training. The average age of a journeyman electrician has gone up materially. Old Father Time takes his toll with great regularity.

Management has its headaches and shortcomings too. There is the matter of dilution of management. Most contractors today are attempting to do twice as much work as they were or-

ganized for. This results in inefficiencies of management.

Take the role of construction engineering on an electrical contracting job. Get the distinction between "construction engineering" and "design engineering." Design engineering is what the architects and consulting engineers or large engineering firms do. It is merely the determination of customers needs and standards and preparation of drawings and specifications indicating them.

It is the function of the contractor to take these designs and apply labor, tools and equipment to them, to render a complete project.

Only the electrical contractor is in a position to provide the application of engineering work required, embracing as it does the most economical use of materials, of tools, construction methods, preparation of shop drawings, estimating, bills of material, coordination of details with other trades and expediting of the materials.

This construction engineering requires a well-trained, highly educated type of personnel. They are not easy to find. It has been the experience of successful contracting firms that it takes from five to ten years, depending upon the individual, to train a man thoroughly during the regular course of business for this job. There is no school, no course available for such training. Experience is the only teacher.

The contractor's ability to perform is limited by the number of such men he has on his staff.

We have all too few contractors with this talent. We do have contractors who contract for much more work than they can properly handle and as a result this engineering work does not get done or is neglected.

You will have to select your key men, train them to handle the less efficient men and train them not only to do the job of installing conduit, wire, switchboards, panels and fixtures, but teach them also that there are other costs that go to make up the costs of this industry. Overhead and job expense must be controlled. Your key men are your foremen. These men can and do make overhead and job expense. You must teach them that there are these other costs to be considered if we are to cut costs and stabilize production.

Don't tell me they won't listen! We have tried it! Our foremen are willing to come in to our office on their own time and discuss their problems jointly. They feel that we are contributing something to them as much as they are helping us. When I say jointly, I mean that this foreman's problem today may be another foreman's problem tomorrow, so they demand of each other that all problems be jointly discussed.

They cleared the tool situation in our shop overnight. They also reduced our delivery charges on jobs. How? By having it pointed out to them in a friendly manner that the delivery charges are a cost against their job! After all, they are foremen because someone thinks that they can do a job better than someone else.

I have read recently that the miners are back at work, producing as they have never produced before. We, in the construction industry, are paying higher wages than the miners get. Are we producing? Labor alone is not to blame for high costs. Are we, as management, doing the best job possible? I don't think we are. I think we should look within; put our own house in order. When we have done that, then we can turn to our suppliers and demand that they function as suppliers. We can then turn to labor and say, "You are a part of this industry—PRODUCE". And above all, we should be able to take a lump-sum contract and know that our material and labor costs are good for the life of the contract.

The escalator clause was vicious. The lack of firm delivery dates is vicious. Every effort on the part of the electrical industry should be made to eliminate these things. In other words all of us, manufacturer, wholesaler, contractor and journeyman, should quit blaming someone else and get to work, each putting his house in order and justifying his place in the picture.

If we, the electrical construction industry, put our house in order, we collectively do our part. However, the entire industry is involved. From the architect down to the least of the specialty contractors there is room for improvement. Either the owners do not furnish the architect necessary information, or the architects and engineers do not finish their plans, for there seem to be but few plans come out where you can reasonably assume that the job that you start out to do is going to look like the plan when it is complete. Changes cause delay. There is room for improvement in the entire construction industry.

Take care of your business, and it will take care of you.

● COMPREHENSIVE is the word for the Lighting Handbook just revised and reissued by Westinghouse Electric Corp., commercial engineering department, lamp division, Bloomfield, N. J. Priced at $2, the loose-leaf, pocket-size booklet packs into 15 chapters practically all of the information that anyone wanting to design lighting should need.

Lighting Awards

Two hundred winners of gold seal and merit award certificates were announced at the Second International Lighting Exposition and Conference held in Chicago early in November. West Coast winner of the gold seal $100 award in the electrical contractors classification was Spott Electrical Co., Oakland, jointly with utility lighting representative Donald R. Keebaugh, Pacific Gas and Electric Co., Oakland, store lighting. Spott Electrical exhibit, the Sandwich Co. in Oakland, features carefully designed luminous ceiling technique.

Of the 183 merit award certificate winners, the Far West totaled 24. Representatives included in this group were Robert L. Sawyier and Elwood D. Bona, both of Pacific Gas and Electric Co., Oakland; W. B. Petch, Public Service Co. of Coloralo; Walter Meuron, PG and E, Auburn, Calif.; F. J. Rohring, Southern California Edison Co., Redondo Beach, Calif.; Theron W. Fitch, Portland General Electric Co.; Harold G. Cooper, Union Oil Co. of California, Los Angeles; Sol Cohn, California Electric Supply, San Francisco; Amos R. Jackson, Westinghouse Electric Supply Co., Salt Lake City.

Wholesalers' lighting specialists and salesmen on the coast listed as winners in the joint entries were Kermit R. Brown, G-E Supply Co., Denver, with utility lighting representative A. L. White, Western Public Service Co., Laramie, Wyo., and electrical contractor Charles Pope, Pope Electric Co., Laramie—winners of three different store entries; K. W. Moore, Westinghouse Electric Supply Co., Portland, jointly with electrical contractor Herbert A. Hagen, E. L. Knight Electric Co., Portland.

Utility lighting representatives on the coast who were winners in the joint entries include Orville H. Thornall and John C. Epperson, PG and E, Stockton, Calif.; Roy E. Dahlin, Southern California Edison Co., jointly with architect Arthur & Edward Frick; C. M. J. Wood and Paul Horwinski, PG and E, San Francisco.

● THE WASHINGTON state attorney-general has ruled that Seattle city electrical inspectors must accept rulings of the State Department of Labor and Industries forbidding installation of certain types of open-element electric water heaters. City and state electrical inspection officials have had a long-standing disagreement over safety and other factors concerning various types of electric water heaters.

Delegation from Washington, both the state chapter at Seattle and the new one being formed now in Spokane area

LIGHT

IES conferences at Vancouver and Los Angeles observe its progress

"NOT by light alone"—strange words to come from a meeting of illuminating engineers, lighting equipment people, lighting salesmen. Yet in several surprising instances it was that thought which was expressed and explained in the two-day regional conferences of the Illuminating Engineering Society at Vancouver, B. C., Nov. 13-14, and Los Angeles, Nov. 18-19.

Professor R. L. Biesele Jr. of Southern Methodist University, Dallas, Texas, expressed it first in discussing the conditioning of the whole environment of a school to improve the health first, then the acquisition of education in public schools. While lighting plays a vital part in influencing posture and in rate of intake of information, his description of what Dr. Harmon was doing to improve the complete environment in Texas schools placed lighting, whether natural or artificial, in its proper place in the total plan.

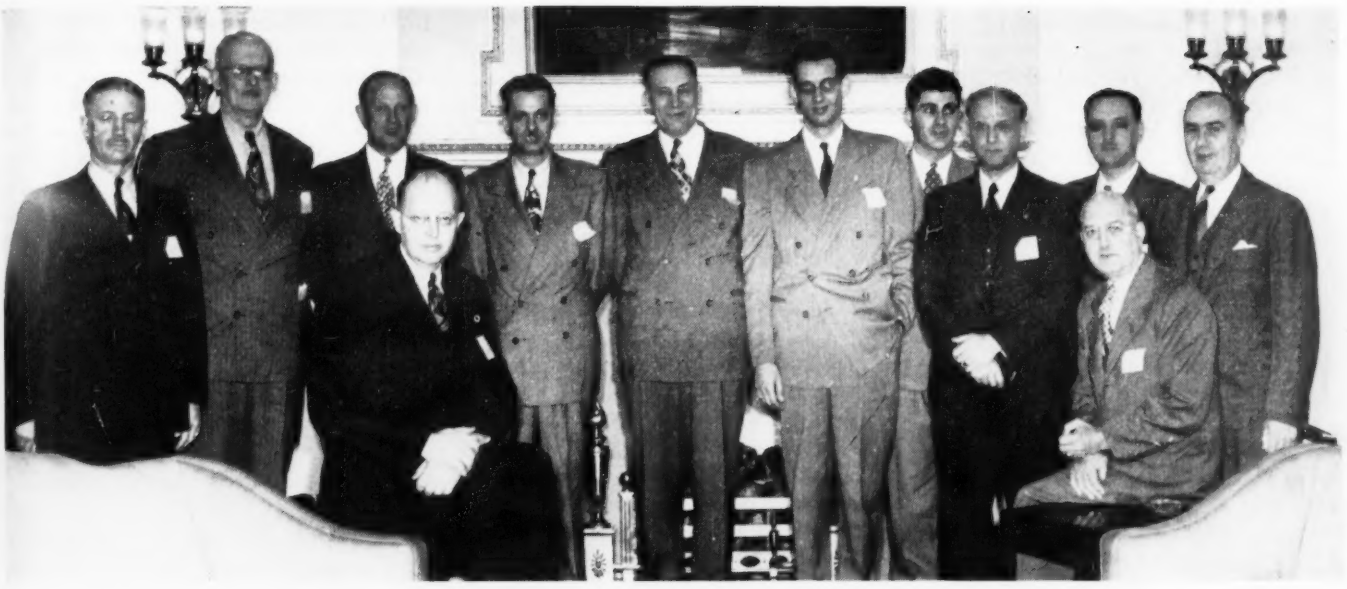
Again in Vancouver, W. A. Trott, Lighting Materials Ltd., abandoned his prepared paper to introduce a big question into the final session of that meeting. After an office is lighted scientifically in accordance with approved design data, is it an inviting place in which to work — or does it have a cold laboratory aspect that people subconsciously dislike? When their work consists of monotonous, repetitive tasks, performed in a laboratory-like, coldly equipped office, do people have a sense of being suspended in air in an environment of light and light colors? Do they not need some strong color somewhere, something to give them a sense of security with the world. Is it not necessary to introduce some interest in their surroundings to enhance the interest in their work? Seeing, Trott reminded, is one of the *senses*. People are not seeing machines, they are people, seeing. He offered no solutions but urged some thought to lighting from the human, the psychological standpoint.

Aside from these deviations the two conferences held pretty closely to the technical. Kirk M. Reid, General Electric Co. Lamp Department, Cleveland, presented two papers, his own as *New Developments in Lighting for Sports and Streets*, and that of Ward Harrison, *Quantity and Quality of Illumination*. Don P. Caverly, Sylvania Electric Products Inc., New York, also handled two of the IES convention papers—that of R. G. Maurette of his company, on *Ten Years of Fluorescent Fixture Development*, and that of Willard Alphin, et al on *Lighting the Patient's Room in a Modern Hospital*. Prof. Biesele presented his paper, *Light for Learning—the Texas Program* at both conferences.

The *IES Progress Report for 1947* was presented in Vancouver by R. E. Lange, Eoff Electric Co., Portland; and by John S. Walsh of PG and E Co., in Los Angeles.

New subjects presented at the Vancouver meeting included the following: *Planned Store Lighting*, by Hal Gardner, engineer, Frederick & Nelson Co., Seattle; *Lighting Installations from Halifax to Vancouver*, by C. A. Morrison, Canadian General Electric Co. Ltd., Vancouver; *An Optometrist Looks at School Lighting*, by Dr. Leighton Roy, president, Oregon State Optometrical Assn.; *Thirty Streets in One*, by C. W. Jarrett, Portland General Electric Co., and *A Concept of Office Lighting*, by W. A. Trott, previously referred to.

Rudolph W. Staud, president of IES, as well as of Benjamin Electric & Mfg. Co., Desplaines, Ohio, attended the Vancouver meeting, presenting a brief outline of the society's program and policies. He was honored by a banquet on Tuesday evening and held a meeting Saturday at breakfast with the officers and boards of managers of the three Northwestern chapters—the Oregon State, the Washington State and the British Columbia, whose chairmen, L. J. Collins, Portland General Electric; Prof. G. W. Shuck, University of Washington, and R. G. Scott, B. C. Electric Railway Co., respectively, had presided over the sessions of the regional conference. A new chapter at Spokane was also petitioned by a group of members from that city, headed by Blair Ploughman, acting chairman.



Oregon's delegation was almost all present when this picture was taken. The Vancouver meeting was truly international

The Vancouver conference itself was under the direction of past chairman E. E. Ackland, Canadian General Electric Co. Ltd., who, with his committee, was complimented highly on a thoroughly well-handled conference.

Walter E. Potter, regional vice-president of IES for the Pacific Northwestern region, General Electric Co. lamp department illuminating engineers, Portland, had made arrangements for the National speakers. He responded to Mayor Charles Jones' welcome to the meeting, and presided at the banquet.

At the Los Angeles conference several other national papers were briefed and presented. Prof. Biesele gave his paper, *Illuminating Engineering as a Profession*. Kirk Reid reviewed a paper by John Campbell on *High Frequency Operation of Fluorescent Lamps*, and another by C. E. Weitz and C. L. Amick on *Luminaire Utilization as Affected by Candlepower Distribution*. Don Caverly presented also *A Study of Fluorescent Lamp Maintenance* by E. F. Lowry.

Several Westinghouse papers were given at the Los Angeles meeting by local men handling the national papers. *Maintenance of Outdoor Lighting Equipment* by Francis T. Tillemans, was read by Robert Harris of Los Angeles. *Correlation of Brightness Ratios and Decorations*, by W. H. Kahler and J. A. Meacham, was given by Charles R. Long, Westinghouse Lamp Division. Walter Alden presented Lorin Brown and Priscilla Presbrey's paper, *Application Data for Down-lighting Equipment*.

William G. Darley's paper, *An Analysis of Reflected Glare*, was read for him by Ted Shepard, Department of Water & Power, Los Angeles.

Because of space limitations in this issue, the foregoing papers at the Los Angeles meeting will be held over for brief summary in the January issue. Attendance at the Los Angeles meeting totaled 140. Sessions were presided over by Don Grandey, Southern California Edison Co., chairman, Southern California Section; A. I. Benedict, San Diego Gas & Electric Co.; H. H. Robison, Pacific Gas and Electric Co., Oakland, chairman, Northern California Section; and Dr. Leland Brown, Stanford University, regional vice-president, who substituted for Frank Hansen, Western Institute of Light & Vision, when the latter became ill. Roy E. Dahlin, Southern California Edison

Robison Dr. Brown Dahlin Reid Grandey Walsh Benedict

Co., as conference chairman, handled the multitude of details such a meeting involves. Only entertainment at the Los Angeles meeting was a joint dinner with the Electrical Maintenance Engineers Assn., Nov. 19 evening.

To make the ideas presented at both meetings of more usable value summaries of papers and presentations will be found in the following pages and in next month's issue.

Q and Q

Between the two world wars lighting levels have been increased to ten times what was used before. Cost has not risen, because fluorescent light output is higher and rates are lower. But the public complains of "too much light," when it should say, "Too much glare."

Kirk Reid thus summed up the situation today and the need for a system to compute glare discomfort, on which Harrison and Halliday have been working. Glare, he explained, can be said to depend on background lighting, reflectance of surfaces, levels of ability to see. There are two kinds of glare, a ceiling glare (which can be measured) and discomfort glare, which can't be. But the public has acted, whether it knew why or not. When ceiling fixtures became glaring, homes were no longer wired for ceiling outlets.

Reid then gave the empirical formula with which the glare factors are computed and illustrated how the factors themselves may be used. In answer to questions he said that at present it would be a rare and intelligent customer with whom a lighting man could discuss the tables; that the factors should apply about the same for normal or subnormal vision; that the tables take a month of computation to produce, so are far from complete for all types of fixtures as yet; and that the aptness of the fixture, its spectral quality, color and other things still need to be considered as well.

Lighting Progress

The IES annual progress report, briefed by R. E. Lange at the Vancouver meeting, and John S. Walsh the Los Angeles one, is a comprehensive review of everything that is new in lighting materials, equipment, sources and applications. The 1947 report was interesting in that nothing radically different was reported but a great number of detail improvements were noted in all fields of lighting. Plastic materials and aluminum are finding increased use as weight conservation. Most of the light sources announced are for trains and buses, operating at lower voltages. The full report in the IES publication, *Illuminating Engineering*, should be read for details.

Fixture Development

Don Caverly, reading Mourette's paper, expressed his personal opinion that there had not been much real development in fluorescent fixtures as yet. He foresees the day when there may be no fixtures as such, that there will be instead, luminous walls or ceilings.

Mourette traced the history of fluorescent fixture design, told of delay in development due to war restrictions on materials, showed how metal conservation had affected industrial fixture designs. He described the standards established by the RLM, Fleur-O-Lier, the American Home Lighting Institute. With longer light sources, it was said, better looking fixtures might be designed because it was difficult to make a 4-ft. fixture look good.

In the home, fluorescent has come in through the back door, so to speak —to light first the kitchen, then the bath. But in conjunction with incandescent it can be used, if properly applied, in the living room. Even in the kitchen, Caverly held, fluorescent shouldn't be expected to do a good job in a center ceiling fixture. Light is needed around the perimeter of the room, over the various work surfaces. As a member of the residential lighting committee, with Myrtle Fahsbender, E. W. Commery and others, he said residential fixture design was made almost impossible by period furniture, especially in a dining room, and suggested a center ceiling incandescent fixture, shielded, low over the table instead of fluorescent.

Store Lighting

Speaking as a buyer of lighting, Hal Gardner, former lighting engineer, now engineer for Frederick & Nelson, Seattle, brought in a purchaser's point of view. A department store looks upon lighting in terms of the profit it will bring or hold. It is not interested merely in looking brighter. It is practical too. Some things may have to await research, but a store will use the tools at hand for a practical solution to its needs.

Gardner reviewed the salient portions of the IES publication on store lighting recommendations, then commented on it. Store owners, he reminded, seek individuality rather than similarity, hence there is no stock answer or solution or pattern for every store. Vanity is the stock in trade of the display man.

A store is no mere warehouse of

Lind Reid Ackland Fletcher Caverly Heinz

goods, nor does it necessarily go for the flame and moth theory of bright light to attract customers. Smart merchants decide the kind of atmosphere they want to create. Lighting plays a part only in creating that atmosphere. As a rule concealed sources are best because then people see the merchandise, not the fixture.

Wiring is the most neglected item. Money is saved by installing *excess* capacity and providing great flexibility and accessibility. Nothing stays in a fixed location for very long in a live store. Wiring needs to be accessible to avoid unsightly makeshifts.

IES President Staud

The society is truly a going concern. It is the most important organization in the field of lighting. Its work can be considered the keynote of that of all others in lighting.

We are engaged, through research and studies, in the accumulation of knowledge about the production and utilization of light, and its effect upon the performance and comfort of human beings; in the discussion of these findings and in their interpretation into standards of lighting practice. Through a program of education and training we transmit this knowledge to our members and to others associated with them to improve their skill and their ability to serve the public.

The IES is not a society of professional engineers only. But we apply the professional viewpoint to lighting problems. The society operates on three levels. The top level is the theoretical one. It is from this level that the basic data are gathered from research.

The second level is that at which these data are worked into recommended practices. The society has 49

Staud Potter

technical committees now working on these problems. One of them is that of recommended practices for lighting in the lumber industry, now being developed in the Northwest region, and one on the canning industry, being developed in the Pacific Southwest region.

Next is the local level, where through section or chapter or study club meetings or classes the lighting education and training is received and, from this, put into practice to serve the public.

The new handbook of the society is being mailed to members at the rate of 325 a day.

How a Child Learns

What are school buildings for, anyway? A monument to the board or the architect—or a machine to work for the child. Let us see what the child needs, then design a building for it. This approach is being made to schools in Texas now since Dr. Harmon, a former health officer, is in charge of school planning for the state, said Prof. Biesele.

Prof. Biesele then described the reasoning back of his program. Study of body mechanics found the best visual position to be at the distance of the hands, swung up naturally from the elbow to a position of rest about 15 inches from the eyes. The line of vision most natural is straight down upon work placed at that position.

Since 80% of school activity is visual, at close range, this is important. A child is a whole individual. You can't divide him. And the primary function of a school is to help him grow and develop. A child learns what he reproduces. He reproduces what he senses. It is much harder to "unlearn" a thing done wrong than to learn the right way first—thus the importance of his seeing and getting his knowledge right the first time.

It is necessary in designing an environment for the child to adjust him to all the stresses to which he is subjected. His posture results from a composite of all these stresses, including the emotional and mental ones. A child doesn't see in order to see—he sees in order to act.

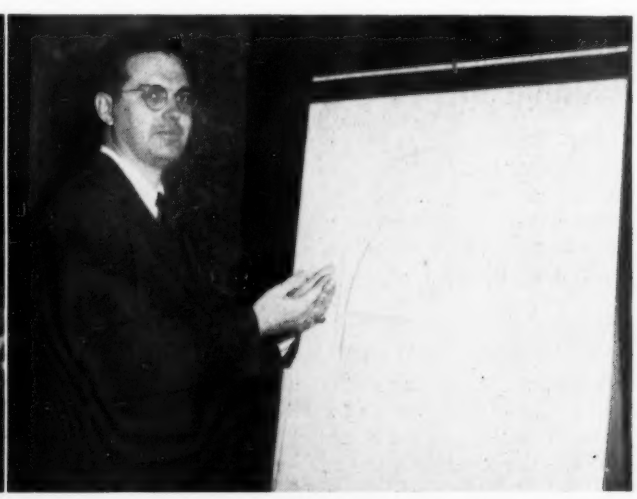
Proper planning will conserve the child's energy for the important calls made upon him. First call is that of keeping alive. Second call is that demanded by his environment. He should therefore be left enough for two other calls—next to fight infection and, last, to grow. A great proportion of anyone's energy seems to be expended just in getting ready to do anything, almost 80%.

How lighting helps is by preparing the mind for action, by orienting a person in space, as an adjusting force to surroundings by letting him see the conditions dangers or obstacles, by speeding recognition of other things or movements in his environment and finally in helping to perform the act itself.

Prof. Biesele then discussed the importance of brightness rather than foot-candles and from that described

Dr. Roy demonstrates with novel projector for eye tests

Prof. Biesele raises hands to natural reading position



what had been done in some experiments in schools in several Texas cities. A great deal has been done by redecorating alone. More had been accomplished by setting desks at an angle to avoid facing bright window areas. Control of natural light by muslin diffusing screens, later glass blocks, was also a contribution, and artificial lighting was also added.

These changes were correlated to a health and posture program, teeth and nose and throat examinations, and altogether the program has yielded healthier children and an accelerated rate of improvement—or intake of knowledge.

Picture Seeing

Instead of the frightening white laboratory frocks and medical atmosphere, Dr. Leighton Roy, Portland optometrist, has developed a technique for eye examination of children and for the teaching of correctional reading which is completely new. He uses pictures—colored cartoons, or glorious Kodachrome outdoor scenes of Oregon scenery. The customary letters are shown against such backgrounds and the eyes seem to respond more as they would in natural environments.

Dr. Roy deplored the fitting of glasses to too many children when, he felt, the condition for which they are given these "crutches" may be temporary or may be caused by poor lighting at home or in school, or may be corrected by simple exercises.

Ignorance of good seeing hygiene, he maintained, was not restricted to the public, or schools, or homes, but often to the optical professions themselves, and he made a strong plea for a complete and widespread educational program among the optical groups, joint seminars on eye and lighting problems between IES and optical groups, and joint meetings of both the above groups and educational and school groups, teachers, PTA, etc.

Reading in Bed

Experiments in some Boston hospitals for the lighting of patients' rooms to provide lighting for comfortable reading in bed were covered in a paper by W. Alphin, Slyvania, read and commented upon by Don Caverly of the same company. The experiment was conducted in already built hospitals and with hand-made equipment under a variety of situations. The object was to provide comfortable light, without glare in the line of vision, when a patient has been ill. The wall behind him is his ceiling and the ceiling is a wall, when he or she is sensitive to adverse conditions which would retard recovery. The color of the light, its effect on the patient's appearance, the need to provide general lighting for the physician and nurse or visitors, makes the problem a complex one. Control of the switching is as important as the lighting, under certain circumstances.

A divided, triangular, two-lamp, fluorescent pin-up-type fixture was used in one case, on each side of the bed, either lamp of which could be switched on or off separately. Another case used a floor lamp, torchier type, with indirect incandescent light. A bullseye lens in the shade permitted extra light to be directed upon the reading matter. The paper made no effort to cover the entire problem; rather to find acceptable auxiliary means to help in hundreds of hospitals, already built, and where the existing lighting is inadequate or wrongly placed for patients' reading.

Streets and Sports

An athlete himself, Kirk Reid has a natural interest in sports lighting, and his specialty at Nela Park is street lighting. It was appropriate that he give a quick review of the latest trends in both—in one talk—at both conferences.

Although lighting of sports is one of the oldest applications of light, five things have brought modern sports lighting into the fore. (1) A sharp increase of interest in sports, particularly at night when more of the family can participate. (2) A marked trend on the part of cities to coordinate their school and recreational programs. (3) Available guides from NEWA, IES and manufacturers to give intelligent data on sports lighting. (4) Improved lighting equipment, mechanically as well as optically suited to the task. (5) New knowledge of improved playing performance under well-engineered lighting.

Reid illustrated, in miniature as it were, by talking of the special studies he'd made recently on table tennis lighting at the request of the table tennis association.

Of street lighting also three new things have been added.

1. There is a growing interest on the part of the public and of public officials in street and highway lighting. Largely this has been due to the growing mass of data as to the effect of lighting on accidents and crime.

2. The industry is offering more efficient and effective luminaires, particularly for use in the residential areas.

3. The IES recommended standards are being adopted as the American standard and thus getting official recognition.

Reid advised welcoming the time afforded by the delays in getting equipment because that time can be used to develop a well-integrated program for the entire city. In this way there can be more assurance that they are soundly planned and that the money spent will give the maximum benefit.

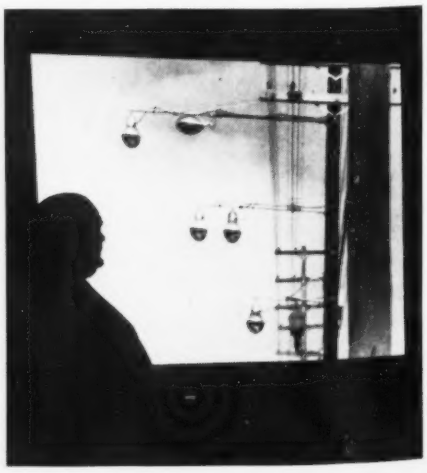
Speaking of the long conflict between street lighting and trees, Reid held out hope for mutual attack of the problem on the best compromise basis by joint committees of IES and the National Shade Tree Conference, with help from the traffic safety engineers. Selection of better tree varieties for streets, of a slender, upright variety, held much promise.

Reid also answered the oft asked question as to use of fluorescent lighting for streets. He gave the results of some American tests. Incandescent sources and equipment so far have out performed fluorescent. Especially is this so in cold climates. He also described English applications of fluorescent to street lighting. It was effective in narrow streets where permitted to be hung over the center of the road but relamping is a serious problem. Value of much lighting, he felt, in England was chiefly as another desperate means of conserving coal (used to generate electricity).

30 Streets in One

Big, good natured C. W. Jarrett, Portland General Electric Co., brought the second Northwest IES conference up to date on the street lighting laboratory which he had announced was in the making a year ago.

Jarrett told, with slides, of the equipment of the laboratory and what would be demonstrated with it. He also reported on some of its results so far. (See EWEST, Sept. 1947, p. 69).



Frequency Change is Big Business

Southern California Edison Co.'s frequency change program progresses at an ever-increasing tempo as cutover crews become more proficient. So thorough in fact has been planning and coordination that completion date for the herculean job has just been stepped up from December 1948 to Oct. 30, 1948. On Dec. 1 of this year 41% of domestic customers had already been cut over from 50 to 60 cycles. Edison's $37,000,000 program has an army of workers busy under a prime contractor and a number of sub-contractors. A fair part of Edison's own staff is on the frequency change, also. Contractors have come up with ingenuity, new methods and techniques. One contractor, California Electric Construction Co., uses trailers as traveling shops for clocks and appliance changes. Two of the accompanying views show this equipment. At top is shown four of 12 trailers used as survey office and shops. First trailer is used by survey superintendent, N. R. James. Second is a conversion shop for refrigerator and washing machine motors requiring only minor changes; third is for phonographs and record players (interior shown at center); and the fourth is a general conversion shop. Lower picture shows the Edison Co.'s own shop for change-over of washing machines.

L. A. to Enforce 90% Power Factor

The Department of Water and Power of the City of Los Angeles has announced that it is now enforcing regulations requiring at least a 90 per cent power factor on all fluorescent or gas tube systems installed in display and refrigerated fixtures. While the regulation covering this was adopted in September 1942, it was not until June 1, 1947, that enforcement was started. The regulation applies to all tube units rated at 15 watts or over and for all gas tube systems. An article on how the department is enforcing this requirement is promised in an early issue.

ELECTRICAL WEST

What of 1948?

AS December brings to a close another good year for the whole electrical industry—despite a threatened power shortage—everyone would like to take a peek under the curtain of 1948. All of the current signs point to continued prosperity. Production difficulties should be less; there should be more of everything electrical to use or sell. The power supply problem should be resolved by early summer. Home building should continue to increase. All in all the outlook is bright.

The industry should recognize, however, that there are some unpredictable economic developments that could change the picture. What will Congress do with the Marshall plan? Ditto with taxes and inflation controls. Not only economics but presidential politics will shape the answers to those questions. What is going to happen to food production in 1948? And to food prices? The country has had six bumper crop years in a row. What will industry do about capital expansion? The power companies will contribute heavily to the expenditure program.

Business men and economists generally agree that prospects are good despite these threats. For our part, we have seen enough of 1947 to know that the industry's Christmas will be merry and bright. And we are willing to predict that the New Year will be equally happy.

Tax Relief Needed

THERE is a definite relationship between what Congress does with income taxes and the over-all welfare of the electrical industry. Tax reductions would be effective in three directions: (1) Removal of the withholding tax on incomes in the low brackets would preclude the necessity for further wage increases and would release additional purchasing power for consumer durables such as major electrical appliances. (2) Reduction of taxes on higher bracket incomes would provide additional risk capital, a necessity if the utilities are to finance their huge development programs. (3) Removal of the double taxation imposed on corporate dividends would attract the risk capital that now seeks other channels of investment.

Although the first of these three is fundamentally important to the whole economy of the industry, the last two are vitally important to the power companies. Approximately $1 billion is being spent by power companies here in the West on a 4-year construction program. In the U. S. the total will exceed $5 billion. Much of this money must be raised through borrowing. And the investment must not only be attractive to the public, but the public must have the money to invest. A change in the income tax laws would insure both of these conditions.

Whose Code Is It?

ATTACKS upon the National Electrical Code are becoming increasingly popular—and dangerous. Certain groups revile some of the code's provisions and propose questionable palliatives. Others refuse to accept its standards and impose local substitutes. Incongruous attitudes develop into strong deterrents to the general acceptance of the code as a minimum requirement for public safety.

For proof study this incongruity. Over the last 15 years California has been represented on the Electrical Code Committee by a notable group of electrical inspectors. Yet apparently none have had sufficient confidence in the product of their efforts to adopt it in the area under their jurisdiction. Three major cities have been represented by some of these individuals and yet not one has accepted the NEC as its local wiring regulation. The same may be said of the state itself for its representative on the committee has opposed recommendations that the NEC become the standard in the field which he supervises.

Equally incongruous is the position of the NFPA, the creature of the insurance companies which has the primary responsibility for the NEC. Originally the code was established to minimize fire hazards resulting from faulty electrical wiring. The NFPA still maintains close control over the revision of the code. However, when the code is under attack as it is now, the apathy of the NFPA is something to cause wonder and concern. Defense of the code

EDITORIAL VIEWS

then becomes the responsibility of the electrical industry.

Reasonably one might assume that if the code holds any value for the insurance people, they might recognize its present jeopardy and actively assist in defending it. If, on the other hand, they are no longer interested, and feel that the matter has become the responsibility of the electrical industry, they should logically relinquish control to the electrical people.

In the face of such paradoxes as these, there is plenty of reason for the industry to be concerned over the increasingly vigorous, and sometimes vicious, attacks on the code. If the sanctity of the code is to be maintained, the people who originated it and those who write it must become its staunchest defenders.

IES in the West

DISAPPOINTMENT was expressed rather vigorously by members of the Illuminating Engineering Society, particularly of the Southern California Section, that the national council of their society refused to bring the 1949 convention to Los Angeles. The society has made large membership gains in the West, regional conferences originated in the West and have flourished since. The last IES convention on the Coast was in 1939, ten years ago, at San Francisco, and 1949 is a year of state celebration of gold rush days. And have not the far westerners either been put to big expense to go east to a convention or had to forego them? All reasonable contentions.

Unfortunately the last few IES conventions have seemed to be at opposite ends of the continent, however, and it was time one was held in the center to balance the load on expense accounts. But President Staud has suggested that efforts be made to obtain the 1950 meeting in Los Angeles instead.

Certainly the West has much to show the IES in the way of advanced applications of illuminating engineering. Being young and enterprising, the business community has been eager for the latest and best in lighting. For examples of theory put into practice, no better locale could be chosen. Let the West unite to ask for a visit again in 1950.

Value of Meetings

IF the United Nations could make an about face and pattern its meetings on the constructive ones in this electrical industry, what a fine world it could be! Some narrow contractors associations or selfish dealer groups sometimes resemble the UN squabbles, pulling and tugging and tying themselves up in knots for fear of one another. All they do is restrict and construct their market and share in poverty.

Thankfully most of the organizations in this still energetic and live business are eager to make it a better, a larger, a more prosperous business. The purpose of the meetings is to share knowledge, techniques, information, ideas and wisdom in order that all may do better and prosper. The convention just for a binge and an escape is rare nowadays. There is so much new to learn, so much general good to expand. If it seems there are too many meetings, it should be remembered there is so much going on, at so fast a pace, that only by sharing knowledge can all hope to keep up with it.

THE buyer's market is not coming. It is here, and it is here with growing intensity. It is increasing day by day, and week by week, and will continue to increase month by month. As a matter of fact it is beginning to show up very distinctly the competent and the incompetent, the efficient and the inefficient in business. In addition to going into a buyer's market, we are going to find ourselves dealing with the most sophisticated, cynical, discriminating buying public in all business history. New developments, new discoveries, new inventions, are going to bring out new products on the market, and merchandise by the millions of dollars is going to become obsolete, with entire plants included, because the public today discards the old and accepts the new on almost an overnight basis.—Harry Boyd Brown, president, Good House Stores, Inc.

Northwest Assn. Groups Outline Programs

THE Business Development, Engineering and Personnel sections of the Northwest Electric Light & Power Assn. have held planning meetings in recent weeks to set up their committee work and programs for the year. Each will hold spring conferences as usual. The Accounting and Business Practice Section is yet to hold its executive meeting.

Inhibited from any real business development activity by the critical power situation in the Northwest, the planners of the Business Development Section turned to "what to do 'till the doctor comes" measures. Meeting in Vancouver, B. C., November 11, 12, under Sectional Chairman Howard Walters, general sales manager, B. C. Electric Railway Co., some 30 representatives of utilities, contractors, dealers, manufacturers and distributors took steps to still further veer the association toward a more industry-wide coverage.

Advantage will be taken of the enforced "mark time" period of power stringency both to study new forms of electrical usage, new trends in utilization development, and to broaden the scope of the organization to make it more valuable to all allies in the electrical industry.

Victoria was tentatively selected as the site for the spring conference of the section, late in April or early in May. It will be a three-day meeting, half of it devoted to general sessions of broad interest, with prominent speakers. The other half will give the six bureaus opportunity for study and discussion of their particular fields of interest. J. F. McAllister, Utah Power & Light, was nominated for section vice-chairman.

The Electrical Home Bureau, with W. C. Mearns, B. C. Electric, as chairman, has three committees. First is one to study new electrical equipment for the home, such as new designs of water heaters, automatic laundry equipment, electric bed coverings and disposals. Ralph Gale, Idaho Power, was asked to lead a discussion group on that subject at the spring conference.

The home service committee, headed by Jean E. Mutch, B. C. Electric, will hear ten-minute reports from all home service directors as to the type of program each is carrying on. Particular interest in kitchen planning, laundry planning and home decoration by lighting will be developed.

House heating will become indoor climate, and a committee, headed by R. E. Sinclair, Pacific Power & Light, will study the heat pump load, and auxiliary equipment, such as electrostatic precipitators, germicidal lamps and sunlamps.

Commercial and Industrial Bureau, under K. E. Hollingsworth, Puget Sound Power & Light, chairman, will have four committees. First will be a revived commercial and industrial heating and cooking committee, under Carl Hoffman, Washington Water Power Co. It will look into commercial water heating as a load factor improver, rather than as a load builder.

The lighting committee, headed by Robert Scott, B. C. Electric, will study the national "Planned Lighting" program, the direction lighting load is taking, and sales aspects of power factor regulation.

Industrial load controls will be considered and experiences exchanged by another committee, led by Clarence Scheyer, Puget Sound Power & Light.

Data sheets on industrial heating will again be prepared and published by ELECTRICAL WEST. The data sheet committee, with members in each company, will clear material through its chairman, Arthur Greisser, Portland General Electric Co. Prizes will be offered for the most useful data sheets on such subjects as welding, water heating, electronic heating, controls and all-electric bakeries and restaurants. Data sheets that are published will be paid for, and quantities of data sheets will be sold to member companies and others.

Advertising and Publicity Bureau, headed by H. J. Merilees, B. C. Electric, was unable to lay out its program due to the chairman's preoccupation in a streetcar strike at the time. Need was expressed for preparation of factual data by all companies to supply school debaters.

Adequate Wiring Bureau, led by Homer Bender, Washington Water Power Co., expressed the viewpoint that while power to sell is short, the time and money that might have been spent on sales promotion could best be turned to selling the public on demanding adequate wiring, and providing the industry with sales insurance for the future. The committee will advocate an industry education campaign, educational programs in the schools, to public groups, to builders and contractors.

Rural Electric Bureau, of which R. H. Gram, B. C. Electric, is chairman, will operate on the broad princi-

Guy Davis, Pacific Power & Light; J. T. Krivanek, Longview contractor; W. C. Mearns, B. C. Electric; H. Bender, WWP; R. H. Gram, B. C. Electric Ry.

ple that what can be done to contribute to the prosperity of agriculture will contribute to the prosperity of the commercial interests that supply the farmer. It will direct its efforts toward aiding the food production and conservation programs of both Canada and U. S., now called for to feed the hungry of Europe.

Dealers - Contractor Bureau, headed by Dean Pulsifer, Westinghouse Electric Supply, is a new bureau formed by merging with the former *Sales Promotion Bureau*, of which Guy Davis, Pacific Power & Light was chairman. It will advocate formation of local coordinating committees of all branches of the industry in each trading area, using existing leagues or associations wherever possible. It will advocate that utilities continue educational work among dealers and distributors in the fundamentals of selling and store management, and it urges that utilities announce their programs to the trade more effectively, by calling in all branches for consultation in setting up promotional programs.

Along the same line, W. A. Cyr, ELECTRICAL WEST, outlined the activities which the leagues, bureaus or promotional associations of the West carry on, as an indication of what can be done. His material was requested published in some future issue of the magazine.

Engineering and Operation Section

Under the chairmanship of Lester Gamble, Washington Water Power Co., the executive committee of the Engineering & Operation Section in Spokane, October 30 and 31, organized its six committees and suggested subjects for consideration, and recommended that the annual spring conference of the section be held in Spokane in April, depending on available hotel arrangements.

Electrical Equipment Committee, with Joe Hellenthal, Puget Sound Power & Light Co., chairman, will study simplification of substation designed to reduce cost, equipment developed for expediting construction and maintenance of equipment, and the effect of high overload on the life of equipment.

Two subcommittees will give attention to specific types of equipment. Meters and services subcommittee, headed by Ellis Van Atta, Pacific Power & Light Co., will look into labor-saving devices and new testing equipment that have been developed to offset rising labor costs. The electronics equipment subcommittee, with L. G. Walker, Idaho Power Co., chairman, will make a study of FM radio and supervisory control equipment.

Power Production Committee, under the chairmanship of A. L. Pollard, Puget Sound Power & Light Co., will look into cleaning turbine blades by water injection, protective coatings for steel and concrete, operation of steam and hydro governors and the availability and cost of fuels in the Northwest.

Transmission and Distribution Committee, C. H. Kirk, Montana Power Co., chairman, will consider rural line adequacy, streamlining distribution construction by the use of aerial cable and vertical construction, operating problems in connection with capacitors, the automatic sectionalizing of transmission lines, and will make a study of the use and performance of poles of different woods and the treatment of these poles.

Utilization Committee, under John Bankus, Portland General Electric Co., chairman, will study power factor correction from the customer's standpoint and the enforcement of power factor clauses in rates, and will look into the characteristics of load at substations. Reducing system peak by voluntary cooperation from large users and through other controls will be investigated.

The Code Committee, of which M. T. Crawford, Puget Sound Power & Light Co., is chairman, will report on interim amendments of the NEC and other code developments, and will attempt to have ready the final report on Section 4327, covering the single phasing of three-phase motors through the blowing of one of two fuses on wide-delta circuits.

House Heating Research Committee, O. L. LeFever, Pacific Power & Light Co., chairman, will have a progress report covering new data from tests run by Portland General Electric Co. and Puget Sound Power & Light Co., and will present a resume of the extent of the use of the heat pump in the Northwest, and the results that may be tabulated at this time.

Personnel Section

Organization of the Personnel Section was completed at a meeting of that section's executive committee in Butte, Montana, in September. Under the leadership of O. A. Peterson, B. C. Electric Railway Co., the section will carry six committees which were fully organized and given a working program at the Butte meeting.

Primarily, the committees will keep up to date the information and data already gathered on a number of phases of personnel work, by exchanging information on changes put into effect in the various companies.

Employee Training, with S. E. Skelley, Pacific Power & Light Co., chairman, will interchange information on company program of on-the-job training, employee information and indoctrination, and the assisting of employees to take courses looking toward personal development.

Accident Prevention and Safety, T. W. Lowry, Portland General Electric Co., chairman, will have his committee keep up to date on company programs on accident prevention and emphasize training for executive and supervisory groups. This committee will sponsor a special evening program for safety directors and others interested in accident prevention adminis-

Homer Bender conducted a family circle on that old home question, adequate wiring and the group evolved a program to stress wiring while power is scarce

tration, at the time of the section conference.

Employee Benefits and Welfare, L. T. Matter, Puget Sound Power & Light Co., chairman, will keep the companies up to date on changes in company programs and policies with respect to such matters as pension plans, sick leave policies, medical aid and hospitalization, vacation pay, and kindred subjects.

Employment Committee, R. B. Middleton, B. C. Electric Railway Co., chairman. Company practices and procedures on recruitment, selection, placement and transfer of employees will be re-examined, with a view to recording any changes that may have taken place since the last report.

Salary Standards, L. W. Nims, Utah Power & Light Co., chairman. Job evaluation, merit rating and salary administration, rapidly taking a prominent place in the work of personnel departments of member companies, will be given a careful re-examination.

Records and Forms, R. H. Sessions, Idaho Power Co., chairman. The matter of forms and records used by personnel departments in the member companies, having been the subject of intensive study in previous years, will be kept up to date by recording changes through the discontinuance or addition of forms authorized with the reasons for such changes.

The committee has not yet set a time and place for its annual conference, but this will likely be in the spring.

California Municipals Urge More Efficiency

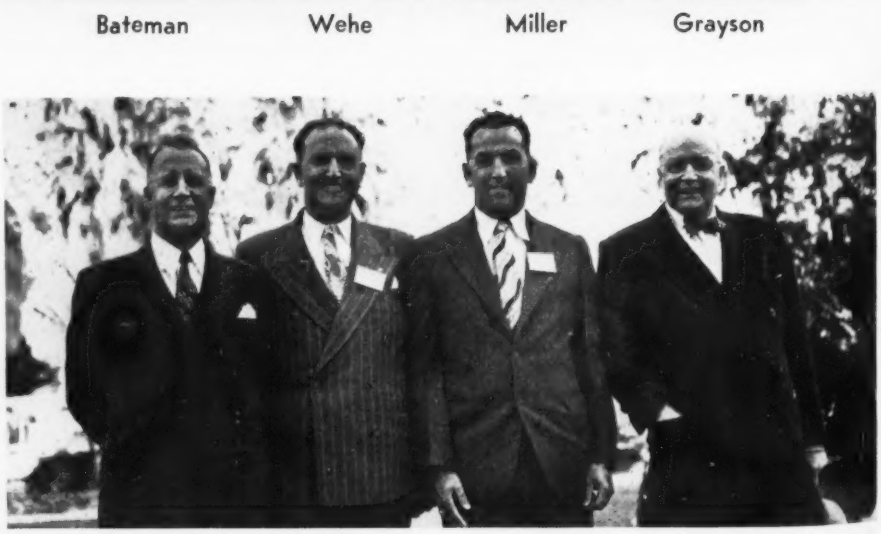
Increased efficiency in management of municipal utilities and more reasonable amounts diverted to general city funds were urged by Carlton L. Nau in a speech before the California Municipal Utilities Assn. annual conference in Sacramento Nov. 19-21. Nau, who is general manager of the American Public Power Assn., said that through improved technology, larger units, and interconnection of systems, private utilities have established a greater ratio of rate reductions than public bodies. This trend if continued, he added, could deprive municipal utilities of their greatest advantage—lower rates.

Roy Wehe, assistant director of public utilities, Public Utilities Commission of California, warned that present revenues may not be adequate to meet increased cost of operation of utilities due to such factors as rising costs of materials and labor. During a discussion period he observed that the government can realize maximum revenue from Central Valley power by sale of that power at present rates at the bus bar rather than by resale to individual utilities over bureau-owned transmission lines.

Present status of the Central Valley project was outlined by Richard I. Boke, regional director, U.S. Bureau of Reclamation. Construction, which is now at the rate of $4,500,000 per month, will total something over $40,000,000 in 1947 and about the same for 1948. It is anticipated that the end of 1948 will see completion of the 450,000 kva. of capacity at Shasta and Keswick. Boke also outlined the projected transmission loop down the east and west sides of the Sacramento Valley, meeting at Tracy. In answer to a question from the floor, he indicated a feeder to the San Francisco Bay area would be considered if sufficient demand were voiced by interested groups.

Discussion by C. F. Montgomery, State Division of Highways attorney, of the Collyer-Burns act concerning relocation of utility facilities on state freeways indicated substantial progress since its original appearance a year ago. Basis of the act, he indicated, is that in constructing freeways the state will allow credit for necessary relocation of a utility facility not already on a highway, or one on a highway built after the facility. Revision of the act to include a provision for exceptions in cases of extreme hardship is expected to assist materially in making it more

Bateman Wehe Miller Grayson



Huls Baxter Frey McCaffrey

satisfactory from the utility viewpoint.

Labor relations problems of public employers with the many ramifications of practical versus theoretical legal aspects were presented by Richard Carpenter, attorney, League of California Cities. During ensuing discussion I. L. Bateman, assistant manager in charge of operations, Los Angeles Department of Water & Power, outlined the grievance system recently incorporated as part of the working rules of the department. He said it is anticipated that separation of compensation grievances (settled by job evaluation studies), will allow settlement of 95-98% of those remaining without need for appeal beyond the supervisory level.

Four parallel dinner and discussion groups on purchasing, accounting, sales and engineering were a new and well-received feature of the conference. Officers re-elected for the ensuing year are G. A. Baxter president, F. V. Frey secretary, and F. S. Miller treasurer.

Quick Catch-up

Electric Clubs

Prominent industrial leader Walter Geist, president of Allis-Chalmers Mfg. Co., told San Francisco members the story of the Allis-Chalmers strike. Geist also gave his talk before the Los Angeles club . . . Members heard James Lash, assistant to the general manager, San Francisco housing authority, discuss some of the city's future problems . . . Lt. Col. Dick Smith described the army's universal military training program at Fort Knox . . . NBC stars and orchestra highlighted the Nov. 17 luncheon . . . *Hockey or Hookey* program put on by Les Cunningham, San Francisco ice hockey coach, and Walter Mails, leader in combating juvenile delinquency.

Club member Frank Falge, manager, G-E Lamp Department, Pacific sales division, Oakland, presented slide film by the G-E Lighting Institute to Oakland club members . . . Bill Appleton, Styles & Appleton, Oakland, demonstrated the magnetic tape recorder . . . Through the courtesy of Standard Oil Co. of Calif. members saw film entitled *California Centennial*.

Old-Timers Day honored charter members and old-timers of the San Diego Electric Club, with guest speaker Jess Zwiener, the club's third president . . . Color movie of wild life in Alaska shown at the Nov. 18 meeting by courtesy of Andy Borthwick, vice-president of the First National Bank.

Lt. Gen. Ira C. Eaker, recently retired as deputy commander, army air force, and now vice-president of Hughes Tool Co. of Houston, Texas, spoke to Los Angeles club members on the vital question, *Is There a Plan for National Security* . . . Significance of the Bikini test was interpreted by Dr. Stafford L. Warren, dean of UCLA medical school . . . Thanksgiving reunion brought members together for the traditional Old-Timers Day.

IES

Progress in lighting and IES plans for the future were discussed by Samuel G. Hibben, director of applied lighting for the lamp division, Westinghouse Electric Corp., Bloomfield, N. J., at the Northern California Section meeting on Nov. 12 . . . Members met at the officers club, Treasure Island, for a dinner meeting, with Farnsworth Currier, general manager of the Currier Co., Oakland, as guest speaker; his topic—*Application of Near Infrared to Industrial Processing*.

Tips from an expert photographer were gleaned from members of the British Columbia Chapter at a meeting held at the Steffens-Colmer Studios where Don Coltman of Steffens-Colmer Ltd. illustrated points of good photography.

Inland Empire Electrical Dealers Assn.

Officers were elected and future plans discussed at the first anniversary meeting of the Spokane Chapter of the Inland Empire Electrical Dealers Assn., Nov. 12. Chosen to head the group for 1948 are: John Boothe, Brown-Johnston Electric Co., re-elected president; V. J. Morris of the V. J. Morris Co., vice-president; Kenneth Hughes, Hughes Electric Co., treasurer; Frank Toole, Washington Water Power Co., secretary; and Robert L. Wilkinson, executive secretary.

Proposed plans include a program to acquaint customers with developments in electrical equipment and assist them in getting the best results from the appliances they purchase.

Other chapters of the association held their annual elections and quarterly general meetings in November, heard reports from the presidents and announcements of planned promotions.

Vancouver Electrical Assn.

More than 100 members attended a recent meeting of the Vancouver Electrical Assn. presided over by R. Hall, chairman of the association's educational committee. Principal speakers were L. H. Miller, city electrician, Vancouver, B. C.; Lance Robson, assistant provincial electrical inspector, B. C. government, and S. Sanderson, Vancouver chief electrical inspector.

IEA

Sevier County Chapter, Richfield, Utah, heard Eldon Dean, Flint Distributing Co., discuss modern methods of selling . . . Cache Valley Chapter, Logan, Utah, had as guest speaker Ed Boggess of General Electric, who gave a talk and demonstration on FM . . . Southeastern Utah chapter featured a program entitled *Evolution in Marketing*, by Vere Halliday of General Electric Supply Co. . . . Utah County Chapter heard Dr. Fulton Robinson, head of the department of merchandising, University of Utah, discuss present-day methods of marketing.

EMEA

With a real goal in mind, EMEA of Southern California held a fellowship smoker to raise $600 for the purchase of a motion picture projecter, screen and sound equipment and slide projector. Idea is to improve the program service and promote educational activities . . . Annual joint meeting with IES featured C. H. Ebblewhite, presented by International Business Machines Corp.; his subject—*Automatic Recording & Control Equipment*.

IAEI

Annual section meeting of Southern California Chapter held at Riverside . . . NEC Code discussion at Burbank meeting. G. W. Taylor spoke on prefabricated housing . . . Regular quarterly chapter meeting of the Puget Sound Chapter was held in Seattle.

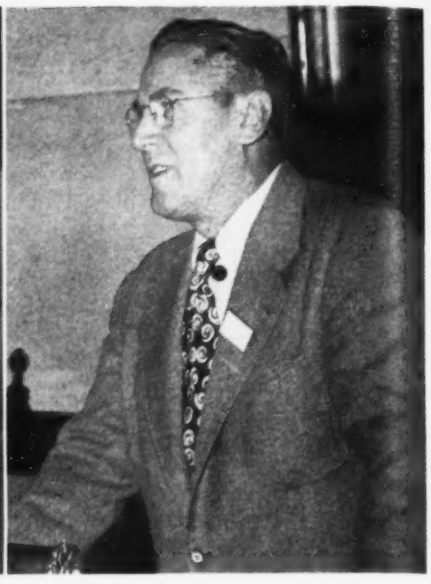
NECA

Social get together of the Rocky Mountain Chapter was held for members and wives . . . On Nov. 19 general meeting was held at the Denver Athletic Club with architects and engineers.

● To SERVE as president of the Electric Club of Washington during the 1947-48 club year is JOHN P. LAWTON, district manager of Graybar Electric Co. He succeeds TOM M. WIDRIG of Trumbull Electric Mfg. Co. Starting with Graybar in Chicago in 1923, Lawton became successively sales specialist, later manager of the appliance department in Chicago, and in 1940 manager at Des Moines, Iowa. In 1946 he was made district manager of Graybar with headquarters in Seattle.

W. E. Cranston

Louis Berger D. A. Smith L. E. Starkweather



Chairman E. E. Karsten

No Shortages, Only Markets, NEWA Hears

"There's $870 in business for every new home to be built in the West"

"WHAT share of next year's tremendous electrical market will you get?" This, in blunt words, was the main theme expressed by all speakers, but most directly by Charles A. Dostal, vice-president, Westinghouse Electric Corp., to the 201 electrical wholesalers, utility and contractor guests at the fall meeting of the Pacific Zone, National Electrical Wholesalers Assn., at Riverside, Nov. 13-15. It was the first meeting in six years that had not concerned itself first with shortages. The horizon for the business held promise of expanding markets, based on the $300 million expansion program of utilities of the West.

Dostal broke down into understandable units what this utility program should mean to wholesalers and to their customers, contractors and dealers. He took as a sound guess 100,000 of the 500,000 kva. of generating capacity being installed as that needed to serve entirely new domestic customers, new homes. Each kva. would serve two homes, both of which would require $870 worth of wiring, lighting and appliances, as a reasonable minimum. This should make a market for $174 million in appliances, wiring supplies and an additional $15 million in supplies and apparatus sold to the utilities themselves by wholesalers.

Another manufacturer who talked in terms of dollars of business per unit, was William E. Cranston, president of Thermador Electric Mfg. Co., Los Angeles. The plain-spoken Cranston told wholesalers their unit sales were going down even if dollar volume was going up. He advanced electric heating in milder climates as a means of increasing electric supplies sales. Where the wholesaler gets about $65 out of a $165 wiring job now, the sale of a bathroom heater and a 40-gal. water heater and range outlet will increase service entrance equipment and double the value of the job for both contractor and wholesaler. He urged furnishing of "alternate proposals" along with electrical bids, suggesting extra uses of electricity.

Other aspects of the home market for electrical supplies and appliances were discussed by: Edgar H. Wileman, Barker Bros. home bureau manager, who told of modern trends in home planning; P. E. McCaughey, formerly National Adequate Wiring Bureau, New York, now sales manager, Federal Electric Products, Chicago, who stressed the need for preparing the residential market by preselling adequate wiring; Larry Coen, American Central Mfg. Co., who illustrated means for selling modern kitchens; M. R. Rodger, Bendix Home Appliances, who predicted a $700 million market in washing machines, $50 million in dryers in 1948 and urged better selling techniques to raise ironer sales to similar figures; and Lawrence Pritchard, vice-president, Bank of America, who made an economic forecast for the region.

E. E. Karsten, Gough Industries, Los Angeles, chairman of the Pacific Zone, NEWA, for the past six months was re-elected chairman. D. A. Smith, Graham-Reynolds, Los Angeles, was convention chairman, assisted by Ross Hartley and Fred C. Todt. Louis G. Berger, chairman of the program committee, presided at the closing session; L. E. Starkweather, L. J. Meyberg Co., vice-chairman, at the opening session. E. A. Phillips and J. E. Bisset arranged for golf and W. E. Cranston rode herd on the golf banquet.

Next meeting is tentatively scheduled for next June at Sonoma Inn, Boyes Springs, Calif., according to R. A. Balzari, secretary for the zone. Albert Cage, president, California Electric Power Co., welcomed the group and short talks on local conditions were heard from several other utility executives present. Warren Penn, manager, Southern California Chapter, National Electrical Contractors Assn., also told of contractors' views of distribution responsibilities by wholesalers and contractors respectively.

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Workshops

Marguerite Fenner, PG and E, chairman of the home economics committee, is planning two home economics workshop meetings, one to be held in San Francisco and one in southern California during next February. Topics tentatively scheduled include: home calls, demonstration techniques, electric cooking, refrigeration, home freezing, home laundering, McCall's equipment films. Topics being considered are kitchen and home planning, home lighting, and adequate wiring. Each workshop meeting is expected to last two days.

Committee members are: Mrs. Marjorie Harper, General Electric Co.; Miss Lois Farris, Westinghouse Electric Corp.; Miss Erma Meeks, Hawaiian Electric Co.; Miss Thelma Fahrenkrog, Coast Counties Gas and Electric Co.; Mrs. Geri Furst, Hotpoint; Miss Mary Louise Parks, Leo J. Meyberg Co.; Miss Hazel Marquis, California Electric Power Co., and Mrs. Theia Kamerer, Southern California Edison Co.

Highway Lighting

Members of the Highway Lighting technical subcommittee held a joint meeting in the PG and E building in San Francisco on Dec. 3 with members of the State Highway Commission engineering group to discuss lighting of highways and intersections. The entire group made a field survey of highways and some intersections in the Bay area the previous evening, which formed a basis for discussion during the meeting.

Farm Handbook

Thor Christensen, PG and E, editor on the revision of the farm electrification handbook, now is gathering material for a current edition of the book. The previous edition, published in 1931, found a wide acceptance, copies being ordered from nearly every state and from many foreign countries. It is expected that the new issue will be equally popular, since it will contain the many new uses for electricity on farms and the many revisions that were deferred during the war years. Various sections of the new issue are being compiled by persons acquainted with each particular phase.

● THE PREDICTION on this page in October that the new 1947 edition of the PCEA Uniform Electrical Code would be as popular as the 1941 edition has been justified by returns. In addition to the 92 cities and 3 counties that had adopted the 1941 version, the 1947 code was mailed to municipalities that had not adopted the previous edition, supported by a full page ad in *Western City* magazine for September, an issue largely devoted to the annual League of California Cities convention. Responses from the mailing and from the ad indicate that more communities will adopt the 1947 code than had adopted the 1941 issue.

● WITH THE fall conference just over, here's your next date. The annual convention has been scheduled for the Fairmont Hotel, San Francisco, on June 16, 17 and 18, 1948.

Getting Acquainted

This month's introduction will be the story of a man who was born in El Fique, Ecuador, in 1899, and finally found his way to California where he has been of considerable service to PCEA and its objectives.

He went to grammar and high school in New Haven, Conn., and was graduated from Yale University Sheffield Scientific School in 1920 with a cum laude degree Ph.B. in mechanical engineering.

During the first world war, this gentleman served as an enlisted man in the Naval Reserve Force and served the Navy again during the recent war as a commander. In 1921, he joined the San Joaquin Light and Power Corp. as assistant engineer, operating department, and moved up to assistant to executive engineer and then to engineer, executive division, the position he occupied in 1930 when he went to his present employer. From 1925 to 1930, he had a dual position with the firm named above and with the Great Western Power Co., having been lent to that company for "a few weeks" that turned out to be most of the time from 1925 to 1927.

In 1930, he became affiliated with his present employer as assistant to the vice-president and assistant general manager. He moved up to engineer, department of vice-president and executive engineer; to assistant to vice-president and executive engineer; to executive engineer, the position he has held since February 1946.

He belongs to the following organizations, in addition to PCEA: Sigma Xi, AIEE, PCGA, Yale Alumni Assn. of northern California, San Francisco Kiwanis Club, San Francisco Electric Club, Berkeley Tennis Club, San Francisco C of C, and the Civil Engineers Corps Reserve Assn., 12th Naval District.

In case you haven't already guessed, he lives at 161 Vicente Rd., Berkeley, with his wife, nee Leota Grace Kirby, whom he married at New Haven in 1921, and his three children, James, Kirby and Leota. When there is any time left over from his work, you'll find him on the tennis court, gardening, fishing or making a pack trip into the back country.

You'll find this month's guest photographed on page 123.

In the Hollywood Manner

YOU expect the "colossal" from Hollywood, and Carl Stuewe conducts his Electra City in just that manner. Located with Grauman's fabulous Chinese theater on one side, and the Hollywood Roosevelt Hotel on the other, in a former automobile showroom, it has the largest floor area devoted to electrical appliance merchandising in southern California, and that about makes it the largest anywhere—26,000 sq. ft. of it.

Stories of small dealers have appeared in these columns. But here is a big one, one geared, says the colorful Manager Stuewe of Electra City, for business in excess of a million and a half dollars a year.

Color and glamor is given the huge show room, with its large expanse of windows on two streets, one of them Hollywood Blvd., by surprising color tones in decoration. The ceiling defies illuminating engineering ideas by being a rich orchid color, against which the long rows of fluorescent fixtures make a design and create a ceiling of their own, one of light, which is spectacular from the street. Lush colors are also carried down the plaid papered side walls to cabinet height. Woodwork itself is all in natural light tones.

The wide center aisle from the Hollywood Blvd. entrance points directly to the complete electric kitchen at the rear. The cross aisle, from the other street entrance, leads straight to the wide expanse of record albums along the west wall where the record department extends. Listening rooms for classical records are in a little "cottage" along that wall. Novel feature is an intercommunicating speaker system between these listening booths and the counter to permit customers to ask for other records. Popular records are listened to at open booths along the counter, through ear phones.

A large radio and television salon has been placed at the rear of the store near the kitchen. Stuewe announced recently that his store would sponsor Fulton Lewis Jr. on television as soon as video was well established in the area. The store has kitchen planning, heating and ventilating, commercial refrigeration and radio departments. It contemplates that 70% of its volume will come from floor sales, 30% from field selling by a crack crew of appliance specialists. Before merchandise was plentiful, the fill-in period was made profitable by garden and breakfast furniture and last Christmas even by Mission Pack fruits as gifts.

ELECTRICAL WEST Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © December, 1947

Face the New Year

Get in a strong cash position advises

Ken L. Hampton

Here are three things that retail electric merchants should consider doing as they close the year 1947:

1. **Sell out during the month of December all slow-moving items in their stock which there is any indication may not have complete customer acceptance due to quality of manufacture or brand name acceptance;**
2. **Go over Accounts Receivable carefully and contact all customers who are not paying accounts according to terms and do something about them;**
3. **Take a careful inventory of tools, furniture and fixtures and equipment as well as merchandise and take any losses indicated.**

There is every indication that income taxes may be reduced some in 1948 but overhead expenses as well as operating expenses will probably increase.

It is almost a certainty that wages paid to present employees will be increased and certainly will not be reduced. Sales and advertising expenses will undoubtedly increase due to competitive conditions.

These facts, coupled with the certainty that the well-known brand name manufacturers will be able to offer retailers more merchandise in 1948, make it wise for the retailer to reduce slow-moving items in his inventory and be in as strong a cash position as possible by the first of the year. Not only will he need cash but he will also need floor and warehouse space available. He will need to display and store merchandise which his brand name supplier can deliver him adequately. Moreover, he can offer these manufacturers, when he tries to buy, the added inducement of being able to pay for, give good display to and sell their merchandise immediately.

Bad accounts are always a source of loss to a retail business; 1948 will be a year of further readjustment for many of our people. This means that it may become progressively harder for them to pay their bills. Any account that is showing as slow pay now on a retailer's books should be appraised. We suggest that one of the following actions be taken:

1. **If it appears to be uncollectible, write it off the books now and quit spending time and postage on it; (it can be used as a loss against 1947 income for tax purposes);**
2. **Contact the customer and collect it. If some adjustment has to be made make whatever adjustment is necessary and take that adjustment as a loss in 1947;**
3. **If it needs to be turned into a contract, or is a contract which needs some adjustment in terms of payment, negotiate a new contract with the customer and turn this new contract over for collection to your bank or investment company.**

Many merchandisers find themselves in a strong inventory position because they

have bought brands of merchandise or lines of products which they do not normally offer to their customers. In some cases this means that their cash position has been depleted to as low a one as they would have on a competitive market. This means that they may be facing a situation whereby they could not accept substantial deliveries from their regular source of supply if these sources could make heavy deliveries.

If the retailer is in this position he should examine his inventory of merchandise very critically. He may want to stage a sale and increase his cash position before he closes his business in 1947.

Whether or not he does this he will probably find that a substantial quantity of merchandise in his stockroom should be adjusted downward in price in his year-end inventory. A realistic down pricing, soundly done, is good business. The loss should be taken as a loss against 1947 operations.

This means that he will pay his income tax on a sounder basis for 1947 and he will face the year 1948 in a position to take his usual margin of profit on all sales. It may be very vital to him to have this profit, should the market develop competitively to the point where his advertising and sales expenses expand quickly.

Now that there are plenty and customers aren't

breaking down the doors to buy them—

Just how do you sell an

What you say must be quick. It must strike a response. It must stop the rush to get the iron bought and over with—long enough for you to tell your story of automatic iron advantages.

Ironing is not much fun. It means standing on tired feet. It is a chore or a duty that she wants to do and forget as fast as she can. That gives you your cue, your appeal.

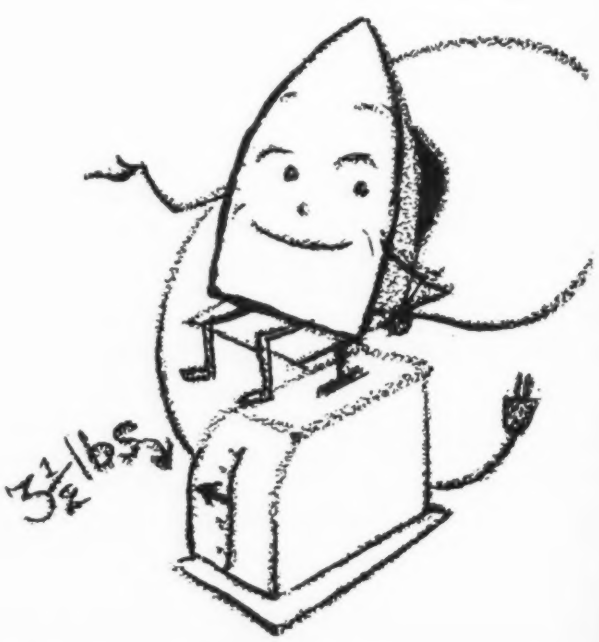
You have only one sentence, one question, usually, in which to stop her. No matter if her first question is to "see some irons," or "what is the price of this iron," or merely a statement that she wants this or that iron, this one question on your part may give you the opening you need to tell her the rest of the story.

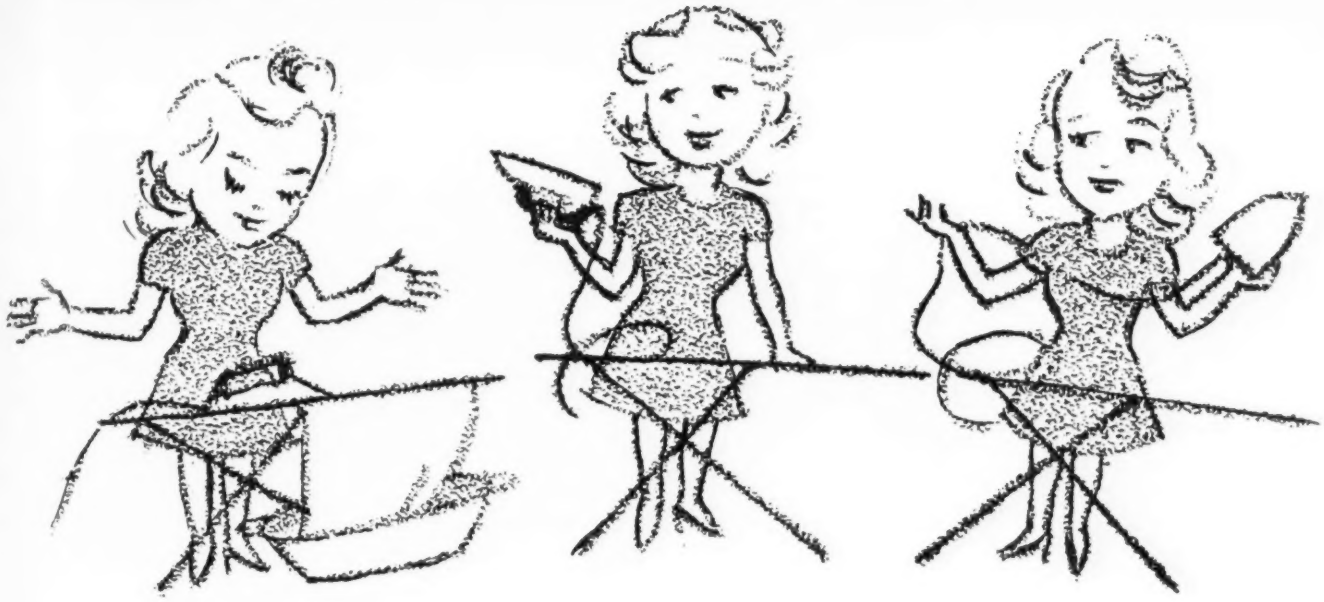
"Have you thought how much MORE you'd get from an automatic iron? Let me explain—"

Tested by many salesmen and saleswomen that simple question has proved to be a "hesitator," an opener from which to go on and tell the rest of the superiorities of an automatic. Just in case you may have forgotten them, here they are, said in a way to follow up that question.

"It's so much safer—just set the control and you know it will stay just the right temperature. Even if you leave it on by accident, it won't do any damage."

"It's so much lighter—and that means it saves your strength. Feel how light it is in





SAFE LIGHT LASTING

Automatic Electric Iron, Anyway?

comparison to an ordinary iron. Multiply that weight by the number of times you must lift an iron while ironing and you can appreciate how much of your energy you can save."

"**It's so much sturdier**—much better materials are put into an automatic to give it **lasting** quality. Take just the cord, for example. It is permanently fixed so that you do not have to pull it off and put it back on. The heat control keeps it just the right temperature for you. This feature protects the iron itself against overheating, keeps the shoe bright and smooth its entire life, and by the way, it eliminates radio interference, too."

"**It's easier to use**—besides being light in weight, it is better balanced, and steers more easily through materials. Even if you have an ironer this is useful in sewing, to smooth seams, take out wrinkles, iron ruffles or edging."

"**It keeps white clothes white much longer**—Too hot an iron is bound to scorch your clothes and no matter how careful you are it is hard to hold temperatures with a non-automatic iron. White things turn yellow. With an automatic this will not happen."

"**It protects rayons**—your pretty rayon and synthetic silk materials are very critical to heat. An automatic iron is almost a necessity to protect them."

"**It heats so fast** — and that saves you money as well as time. Takes just a few seconds to heat up, turns off the current itself, turns it on only when it needs it, and so saves current. Saves time because you do not have to wait for it to warm up; you can really take your time ironing and still get through faster."

Demonstrate the automatic this easy way. Have it near an electric outlet. As you show it to the prospect, ask her to put her finger against the sole plate as you plug it in. It will heat in a few seconds and she will take her finger away. Then say, "Doesn't it heat up quickly? That fast heating saves you money and time." From there you can tell why and talk of its other advantages. The speedy heating will go a long way toward convincing her. She has felt. She knows it's so.

Your Instrument Board

Cost ratio studies give you reference points by which to steer a safe course

Just as the navigator uses instruments and reference points, to steer a good sound and solvent business course, you need some reference points too. With your own figures to compare to those of the average, you can answer your own question, "How'm I doin'?" Fortunately some one has taken the trouble to plot the reference points. The Inland Empire Electrical Dealers Assn. has conducted cost ratio surveys among the Spokane region dealers. Then National Electrical Retailers Assn. has just done the same among dealers all over the U. S. Against these new figures there are the Dun & Bradstreet averages for solvent businesses in 1939. In the table below all three are compared. The figures show 1946 an abnormal year both in low sales cost and high profit ratio. In 1947, the first half year shows a swing back toward 1939 percentages. When they come in, no doubt the last half of 1947 will show still stronger trends back that way. Put your own figures up against these and steer your course accordingly.

		NERA National Average		Inland Emp. El. Deal. Assn.		1939
		1st 6 mo.	1947	1st 3 mo.	2nd 3 mo.	Natl.
ITEM	1946	1947	Ave.	1947	1947	Ave.
Cost of goods	66.1%	66.5%	72.9%	70.5%	69.2%	64.9%
Gross Profit	33.9%	33.5%	27.1%	29.5%	30.8%	35.1%
Operating costs	25.4%	24.5%	17.1%	19.5%	19.2%	33.1%
Occupancy	(3.7)	(3.5)	(3.4)	(3.4)	(1.2)	(3.5)
Administrative	(7.1)	(6.5)	(8.8)	(6.7)	(7.9)	(12.1)
Salesmen	(4.8)	(5.8)	(3.1)	(3.9)	(4.4)	(7.7)
Advertising	(1.9)	(6.5)	(0.8)	(1.8)	(2.4)	(2.6)
Other sales cost	(2.8)	(2.3)	(0.9)	(0.4)	(1.2)	(3.7)
Other costs, incl. service, delivery	(5.1)	(4.8)	(0.1)	(1.0)	(.6)	(3.5)
Net profit	8.5%	9.0%	10.0%	10.3%	11.1%	2.0%

ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

December 1947 ©

Shake down

The shakedown is beginning to take place all along the line. As the long established, nationally advertised brands begin to fill up the back orders things grow harder for the newcomers—and that goes for the manufacturers, the distributors and the dealers who handle these new lines. It is the strong ones among the newcomers which will put extra push behind their efforts and outsell their way into permanent acceptance. The lazy business that drifted in over the transom is no more.

C.O.D.

Credit is tightening up among many suppliers and distributors. With considerable inventory themselves they are warching closer to see that they get paid for what they have out to their dealers. There seem to be more C.O.D. shipments. Another index that both capital and selling are needed.

Versatile

Square D. Co. is taking the wraps off a new button control, 24-volt lighting wiring control system. Unlike previous "Touch-plate" and "Push-Button" systems it uses three wires instead of two in order to feed a pilot light that tells when circuits are on. Will call it Safelex Low Voltage Control.

Returns

Don W. Rennewanz, who left Hotpoint for war jobs when the latter curtailed at the outbreak, returns to Hotpoint now as Pacific District Manager with headquarters in the Western Merchandise Mart, San Francisco. He fills the place made vacant several months ago when Howard Scaife was promoted to bigger things in Chicago. Rennewanz started selling appliances for Pacific Power & Light at Dayton, Wash., later was Joe Platt's assistant in the Northwest district. Worked for Webster Brinkley Co. in Seattle, and recently has been general manager of Kirsten Pipes.

Another unbalance

Canada has put a ban on the importation of American made merchandise as a part of its desperate action to stop the unfavorable balance of trade, and put a 25% excise tax on its own appliances. Because of shortages there had been some relaxation of import restrictions and during the first eight months of 1947 one out of every four washers, one out of every three refrigerators, was U.S. made.

Big tank

Such success was had with its 100-gal. electric water heaters for small apartments and commercial establishments that Seattle City Light has ordered some 200-gal., 30 kw. water heaters for bigger places. This is about as large as will go in a standard door. Has six 5-kw. elements which go on in steps and are considered off-peak load.

NERA doings

Elmer Weinheimer, regional field director for National Electrical Retailers Assn. has appointed an old time trade association man, J. Vance Wallace, as northern California field representative, with headquarters at 1920 Jones, San Francisco. NERA, meanwhile, is moving its national headquarters from Washington D. C., to the Merchandise Mart, Chicago, on Jan. 1. Plans a big "Leadership Conference" there during market week, a 2½ day meeting with top deck manufacturers and dealers. Dates are Jan. 19-21. The association has just released two valuable studies-one on Dealer Costs and Net Profits, and another on the selection, training and compensation of retail salesmen.

Home Shows

Home shows will blossom with the spring. San Francisco plans one at the Civic Auditorium, Apr. 7-14, under sponsorship of the Real Estate Board and Associated Home Builders, with Ira W. Curry, as director. Seattle Association of Appliance Dealers was polling its members to see if they wanted a big Home Show in the Spring. Los Angeles, with its third big annual home show, had June 10-20 as its dates at Pan Pacific Auditorium.

Market

Don't forget the annual Market Week at Western Merchandise Mart, San Francisco, Feb. 2-7. Appliance merchants will find much that's new.

Coops on the spot

Big hearing in Washington D. C. on taxation of cooperatives is about over and it was really a pitched battle. Ex-congressman Jerry Voorhies of California put on the big plea for the coops, admitting tax advantages but threatening to sell cheaper and wipe out profits if taxes were imposed. Congressmen seemed surprised that the coops were into so many businesses and even into owning factories. Even that propaganda sheet that you finance with your taxes, put out by the Dept. of Agriculture, tells glowingly of coops doing $800,000,000 in business in 1946, the wholesalers another $220,000,000. Strong case for the electrical dealers was made by Clif Simpson, manager of NERA.

"Year of Decision"

Deepfreeze can well be expected to put everything into making home freezers the big business that they believe it should be. F. F. Duggan, general sales manager, R. V. Newbell, advertising manager, S. J. Seibert, product service manager, told all western distributors at the San Francisco gathering of them, where to put the steam to make more sales. A sensational direct mail campaign to selected mailing lists will launch the new drive.

More power

Power tightness in Los Angeles was relieved by the starting of a new 87,000-hp. steam generator at its Harbor steam plant last month. These are days when power utility generating capacity puts a ceiling on dealer sales potentialities.

Now in one

General Electric Co..'s appliance and merchandise department recently consolidated its vacuum cleaner divisions into one organization, thus affecting the former Premier, General Electric and industrial vacuum cleaner division, which operated out of Cleveland and Bridgeport under the appliance and merchandise department. Premier's commercial staff will be moved to Bridgeport from Cleveland. A. L. Atkinson was named manager of the new division.

Another line

Kaiser Fleetwing Sales Corp. has franchised Gough Industries Inc. as their southern California distributor of the Kaiser hydraulic dishwasher.

Tale told

Story of the Bendix is told in the November issue of Fortune magazine. The article, "Best-Selling Bendix" views the brains behind the organization, story of the machine, its selling and distribution program.

Lewyt bagless vacuum cleaner was displayed recently at a five-day sales clinic in San Francisco. Alex M. Lewyt, president of the Lewyt Corp., told distributors of the company's plan to increase production of the Lewyt vacuum cleaner in 1948 by 50% above the original estimated figure of 100,000 machines set last August when it was first introduced. — Cleaner meeting

An eye-catching display representing the doorway of a home with eight Lightolier outdoor fixtures attached has been introduced by Lightolier Inc. The lightweight unit is finished in five colors, completely wired so that fixtures may be illuminated; for wall or counter display. — Sales getter

"Planning Your Home For Better Living--Electrically," a 32-page booklet put out by Electrical Living Committee, and available through them at 420 Lexington Ave., New York, emphasizes the importance of intelligent prior planning, proper selection of equipment, and adequate wiring in the home. Points out with colored illustrations new ways to use electricity for better living. — Home booklet

To pave the way for a new economy heater Trilmont Products Co. has announced a marked decrease in the price of its remaining inventory of safety heaters. Retail price has been dropped from $33 to $19.95, and combination price of heater and dryer from $34.50 to $24.95. Model for next year will carry all of the Trilmont safety features but will employ new materials and large scale production to meet a lower price mass demand, according to the company. — Price drop

Plastic Min-A-Kitchens put out by Youngstown are a real selling aid to dealers. The scale models are exact replicas of Youngstown kitchen units and can be set up for any size kitchen. Includes a miniature of the Kitchenaider, standard type stove and refrigerator. Complete set fits into leather case for easy packing. — Toy kitchen

In a contest within a contest the Leo J. Meyberg Co. Inc., Los Angeles, a leader in the Bendix October million dollar sales contest, was a winner of a gold painted football signed by Coach Frank Leahy of Notre Dame. The company in addition won a banquet or its equivalent for its employees. The top distributorships sold over 100 percent of their month's quotas. — Forward pass

A lead on the weather is offered by Rheem Mfg. Co. with its direct mail folder to stimulate heating and appliance business. Mailing piece opens into colorful authentic weather map which reveals the week the first seige of freezing weather will strike in each community of the U.S. Figures based on a two-year study by the Department of Commerce Weather Bureau. Folder also illustrates various heating appliances manufactured by Rheem. — Weather report

Fred H. Brown, formerly sales representative for Northwest Appliance Distributors, has been named manager of the Spokane branch. The firm recently moved to new offices at W. 1015 Riverside Ave., Spokane. — Appointed

Nine new electric home heaters to be distributed nationally have been announced by Westinghouse Electric Corp., San Francisco. All are in production at the company's Emeryville, Calif., plant. Eight of them 240-volt units, the other a 120-volt model. Major change in distribution plan was also announced. Marketing was done previously by the home heating department on limited regional scale through the regular agent distributors. Now national distribution has become responsibility of the agency and specialties division at Pittsburgh with representatives throughout the country. — More models

Instead of packing away the Christmas tree lights why not keep them handy for party decorations. Royal Electric Co. Inc., with their 9-light bubble lamp set has illustrated suggestions on the cover panel of their box showing lamp ideas for all occasions. Colorful decorations using fluorescent tree lights and crepe paper put out jointly by Sylvania Electric Products and Dennison Mfg. Co. suggest how bulbs in pastel colors can be used throughout the home the year around.

Always colorful

Three new Crosley models have been announced by Stanley Glaser, manager of the radio section, Crosley Division, Avco Mfg. Corp. The console radio-phonograph model 88 CR with cabinet by Carrollton, is eight tube, AM-FM short wave, with full tone control and automatic record changer. Another radio-phono combination model 148 CP with Carrollton cabinet incorporates 12 tubes, with FM-AM circuit. New 5-tube table model in low price bracket is known as model 58 TK with miniature tubes and a built-in loop antenna.

Latest styles

In San Francisco department stores...Dohrmann's has completed its new homewares store at 281 Geary St. On third floor are ventilated and sound-proof record and radio demonstration rooms as well as model kitchen and laundry rooms. Modern household department located on the fourth floor...Macy's, San Francisco, formerly O'Connor, Moffatt & Co., has set up appliance and housewares department in the basement of its present building.

Stores expand

Designed for use wherever light is needed for a particular task is the new portable fluorescent wall lamp put out by Sylvania Electric Products. Can be hung onto wall and plugged into nearby outlet or installed directly to outlet box. Called the "Beverly" the lamp furnishes same amount of light as a 100-watt incandescent bulb.

Handy portable

Horton Mfg. Co. has launched a long-range educational program with national advertising to boost ironers in the appliance picture. Aims to work the program into schools with a teaching kit plus an ironing "primer." Distribution is direct in the midwest and southern California. Horton plans to increase demonstrations in dealer outlets and door-to-door. There are four models in the line ranging from a $49.94 table top style to a $139.95 console.

Iron promotion

Date for the Southern California Housewares Show in Los Angeles has been set for April 18, 1948, according to a recent announcement. Canvass conducted by the Chamber of Commerce indicated sufficient housewares makers in the area to warrant a local market. Small firms and new organizations saw the market as an opportunity to meet the trade.

Taking shape

The Launderall automatic home laundry has been adapted for coin meter use in apartment houses and similar installations and will be known as the "Kimeter." Sales to be handled by the Sunline Co., Detroit. The F. L. Jacobs Co., manufacturer of the Launderall recently announced release of a special newspaper cooperative advertising campaign featuring the availability of the home laundry on east credit terms for the first time.

Converted

Electric floor polisher designed for household or office use has been made available by Clarke Sanding Machine Co. Housed in die-cast aluminum the new unit is compactly designed for economy of storage space.

Shines floors

Control Products Inc. has put out a portable pin-up room thermostat to give accurate room temperature control for owners of portable electric heaters. Plugged into heater the thermostat can be hung on wall and adjusted for desired heat.

Reading on the wall

Monarch ELECTRIC TWINS

MODEL F157P ROASTER RANGE

MODEL F56PC ELECTRIC RANGE

HERE is, indeed, an unbeatable electric range set-up: (1) The heavily advertised 2-oven Monarch Roaster range to capture the preferences of those who want the best, and (2) the single-ovened model 56 with "deep pot" cooker for those who want quality at a minimum price. A perfect sales-clinching team! A perfect profit team!

MALLEABLE IRON RANGE CO.
927 LAKE STREET • BEAVER DAM, WIS.

Monarch-Paramount

"TWIN EFFICIENCY"

A. H. NICOLL
President
Started 1911, as a Sales Record Clerk

G. F. HESSLER
Vice President
Started 1906, as a Clerk

C. S. POWELL
Vice President
Started 1914, in the Student Course

E. W. CASHMAN
Vice President
Started 1913, as a Clerk

L. G. FIELDS
Jacksonville District Manager
Started 1924, as a Warehouseman

W. FRAZIER
Kansas City District Manager
Started 1911, as an Office Boy

GraybaR OFFICERS AND DISTRICT MANAGERS ALL BEGAN "IN THE RANKS"

A. D. HAMMOND
Atlanta District Manager
Started 1906, as a Clerk

H. L. HARPER
Los Angeles District Manager
Started 1904, as a Stock Clerk

W. E. HENGES
Cleveland District Manager
Started 1913, as a Receiving Clerk

R. W. KIMBERLIN
St. Louis District Manager
Started 1922, as a Sales Record Clerk

J. P. LAWTON
Seattle District Manager
Started 1923, as a Warehouseman

W. H. MacCRELLISH
Boston District Manager
Started 1907, as a Shop Clerk

G. T. MARCHMONT
Dallas District Manager
Started 1908, as a Service Clerk

J. A. MAYER
Philadelphia District Manager
Started 1913, as an Equipment Installer

C. H. McCLEAN
Minneapolis District Manager
Started 1913, as a Warehouseman

HERBERT METZ
New York District Manager
Started 1914, in the Student Course

J. H. PEARSON, Jr.
Richmond District Manager
Started 1908, as a Salesman

D. WALLACE
Pittsburgh District Manager
Started 1922, as an Assistant Accountant

L. B. WESTFALL
Cincinnati District Manager
Started 1916, as a Service Clerk

E. R. YONKERS
Detroit District Manager
Started 1933, as a Salesman

E. W. SHEPARD
Vice President and Treasurer
Started 1906, as a Clerk

A. C. LAMPERTI
Secretary
Started 1920, as a Bookkeeper

J. P. CARSON
San Francisco District Manager
Started 1910, as a Salesman

G. J. COSSMANN
Chicago District Manager
Started 1900, as a Voucher Clerk

*815 YEARS of electrical experience

***average service 34 years**

Experienced men make an experienced organization.

Graybar — the oldest and largest wholesaler of "everything electrical" — has built its business upon two basic policies:

(1) serving customers well;
(2) filling key jobs from within.

Over the years, this second policy has developed office boys and clerks into department heads, district managers, and corporate officers.

With such opportunity for advancement, every Graybar employee has a powerful incentive to do his job well. The natural result has been a continual improvement in our service to a continually growing list of customers.

Graybar is *totally owned* by its operating and retired personnel. That's another reason why every Graybar employee is personally interested in meeting your electrical needs accurately, helpfully, and as rapidly as possible. *Graybar Electric Company, Inc. Executive Offices: Graybar Building, New York 17, N. Y.* 4799

60,000 FIRST-QUALITY ELECTRICAL ITEMS ARE DISTRIBUTED THROUGHOUT THE NATION . . .

. . . via GraybaR

IN OVER 90 PRINCIPAL CITIES

Gale Robinson Gadsby

What the Customer Wants

Told to spectacular annual meeting of the Intermountain Electrical Assn. of Ogden as prominent industry and sales speakers forecast what salesmen and dealers will be asked to deliver in the year ahead

WITH assured power supply, a favorable market outlook, a growing region and a strong cooperative promotional program, the Intermountain Electrical Assn. faces a rosy future, members were told at the first annual conference held at Ogden, Utah, last month. W. A. Huckins, Utah Power & Light sales manager, conference chairman, and his committees put together a timely program for the 200 Utah, Idaho and Wyoming electrical people who attended.

Reactivation and revitalization of the cooperative forces of the industry through an agency such as the association is essential for industry prosperity, John Longden, Westinghouse Supply Co. branch manager and IEA president, told the group. Initial step in that direction is the IEA "Go All Electric" promotional program just initiated.

By 1950 the three electric companies serving Montana, Idaho and Utah will have an installed capacity of 900,000 kw.. George M. Gadsby, president and general manager, Utah Power & Light Co., told the group. Now under construction and on order is 185,000 kw. of new capacity and an additional 100,000 kw. is on the planning board. Anticipated combined load as of 1950 is 850,000 kw., Gadsby said.

Discussing the political shibboleth of cheap electric power and the need for it in Utah, Gadsby said:

"If a way could be found to relieve private electric utility companies in Utah of payment of taxes and interest, thus putting them on a par with producers of government power, they would be enabled to sell industrial electricity at a cost of 7½ mills per kwh. or cheaper than the rates in the region served by the TVA."

Gadsby asserted that if he could accomplish one great purpose it would be to take electric power off the hook as the bait by which so much has been accomplished and is still being attempted by the national socialistic planners, the end of whose road is inevitably a totalitarian government and police state.

Five years of unexcelled prosperity lie ahead for the electrical industry in this region, according to George C. Tenney, publisher-editor of ELECTRICAL WEST and vice-president of the McGraw-Hill Publishing Co. His prediction is based upon these factors: (1) a $6 billion construction program by electric light and power companies to provide capacity to meet the country's electric power needs; (2) an unsatisfied consumer demand for comfort and convenience-giving electric appliances that will tax the industry's resources to produce; (3) a building boom that will extend five years or longer to meet the housing shortage here in the Far West; and (4) continuing industrial and business expansion in the Far West to keep pace with the population and market growth of the area.

A major industry requirement is improved salesmanship, Tenney said, and he recommended cooperation in conducting salesmanship courses.

Greater danger to the national economy than a depression, Tenney averred, is the cynical and critical attitude of the American public toward the incentive system that has given the people the highest standard of living in the world. The public accepts and worships the products and services of our industrial system, he claimed, but it is both skeptical and downright hostile toward the system that makes the products and services possible. To offset this, he said, business and industry have a sales job on their hands that can be accomplished by applying the same principles of market analysis, product research and advertising that they applied to the products themselves.

Better selection and training of employees is essential for organizations whose people meet the public, Adam S. Bennion, vice-president, Utah Power & Light, told the group. He said that in the future his company intended to make it "more difficult for an employee to join the company and harder still for him to leave it." Best sources of new people, he declared, include families of present employees, friends of the best employees, families of former employees who have left for better jobs and, finally, the graduating classes of colleges and universities.

A potential $6 million rural electrical market can be anticipated in Utah in 1948, according to Ralph Gale, sales manager, Idaho Power Co. It

What the Customer Really Wants

according to Dr. Preston Robinson, professor of marketing, University of Utah.

1. Less salesmanship and more help in buying.
2. Individual attention.
3. Resents being rushed or pressured in buying.
4. Resents being "typed."
5. Wants to be shown merchandise.
6. Wants to know the price of goods.
7. Is interested in specific features.
8. Wants information on care and use of merchandise.
9. Wants sales people to volunteer facts.
10. Wants merchandise demonstrated.
11. Appreciates tactful suggestions.
12. Wants to be allowed to look.

These 2 Certified Lamps have one Big Advantage...

"They use Certified Ballasts!"

● Where fluorescent circular tubes are a part of a CERTIFIED LAMP, the specifications demand that CERTIFIED BALLASTS be used. And good manufacturing judgment dictates the use of CERTIFIED BALLASTS, not only in CERTIFIED LAMPS, but in all types of fluorescent equipment.

The reasons are simple to understand: CERTIFIED BALLASTS, properly installed, prevent excessive heating . . . thereby protecting floor coverings and table tops. They're free from distracting noise. They assure longer fluorescent lamp life and most light from lamps. *They build CUSTOMER SATISFACTION!*

That's why every fluorescent CERTIFIED LAMP is equipped with a CERTIFIED BALLAST. That's why every piece of fluorescent lighting equipment *should* be equipped with a CERTIFIED BALLAST.

CERTIFIED ETL SPEC. NO. 6

CERTIFIED LAMP MAKERS have solved their ballast problems by writing CERTIFIED BALLASTS into their specifications.

CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

Acme Electric Corporation
Cuba, New York

Advance Transformer Company
1122 West Catalpa Avenue
Chicago 40, Illinois

Chicago Transformer Div.
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

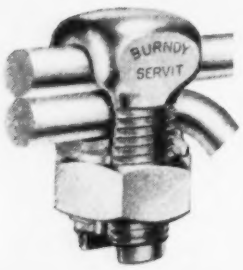
Starring and Company
Bridgeport, Conn.

Wheeler Insulated Wire Co.,
378 Washington Ave., Bridgeport, Conn.

EARL S. CONDON COMPANY
1151 SO. BROADWAY LOS ANGELES 15, CALIFORNIA

BURNDY
ENGINEERING CO., Inc.
107 BRUCKNER BLVD., NEW YORK, N. Y.

Electrical Connectors



Southern California and Arizona Representatives

Earl S. Condon Co., represents: UNITED STATES RUBBER CO. Wire and Cable Div. LAPP INSULATOR CO., INC. • SLATER ELECTRIC & MFG. CO., INC. • COLE ELECTRIC CO. BURNDY ENGINEERING CO., INC.

What's cooking in a "JET"

Diameter of Thermocouple compared with Pin.

THIS small-diameter thermocouple records temperatures inside a jet. Thin as a thread, it can be employed in lengths up to 20 feet — laid along surfaces, snaked around obstructions, fed through apertures, sealed in walls and left protruding into space. Inserted into pressure and exhaust chambers of jet engines, it is maneuvered to obtain temperatures of gases at many points.

Top performance has been achieved by using a winding of Advance* wire inside a seamless copper tube—because it has a negligible temperature coefficient of resistance; develops high and uniform e.m.f. against copper; is very ductile; is resistant to heat and corrosion. Thermocouple junction is made by cutting the assembly to length and welding or brazing the wire and tube at one end.

Small proportions make this an ideal instrument for use with midget mechanisms.

Whether your product be large or small, if you employ special purpose alloys consult with us. We can supply the alloy with electrical and physical properties best suited to your needs.

*Trade Mark Reg. U. S. Pat. Off.

Driver-Harris COMPANY
Stocked for the Coast Trade at: ANGUS-CAMPBELL, INC.
235-241 San Bruno Ave. San Francisco • 449 So. San Pedro St., Los Angeles • 2122-4th Ave., Seattle
Main Office and Plant: HARRISON, NEW JERSEY

will include $4,650,000 in appliances, $250,000 in electrically driven farm equipment and $1,100,000 in wiring supplies and wiring installations. The appliances and equipment, he stated, would consume an additional 18,000,000 kwh. of electric energy.

Four important customer attitudes as revealed by an extensive survey were told to the group by Dr. Preston Robinson, professor of marketing, University of Utah, in a discussion of "What the Customer Wants." He listed also the following qualities of top-flight salesmen as determined by a long series of investigations:

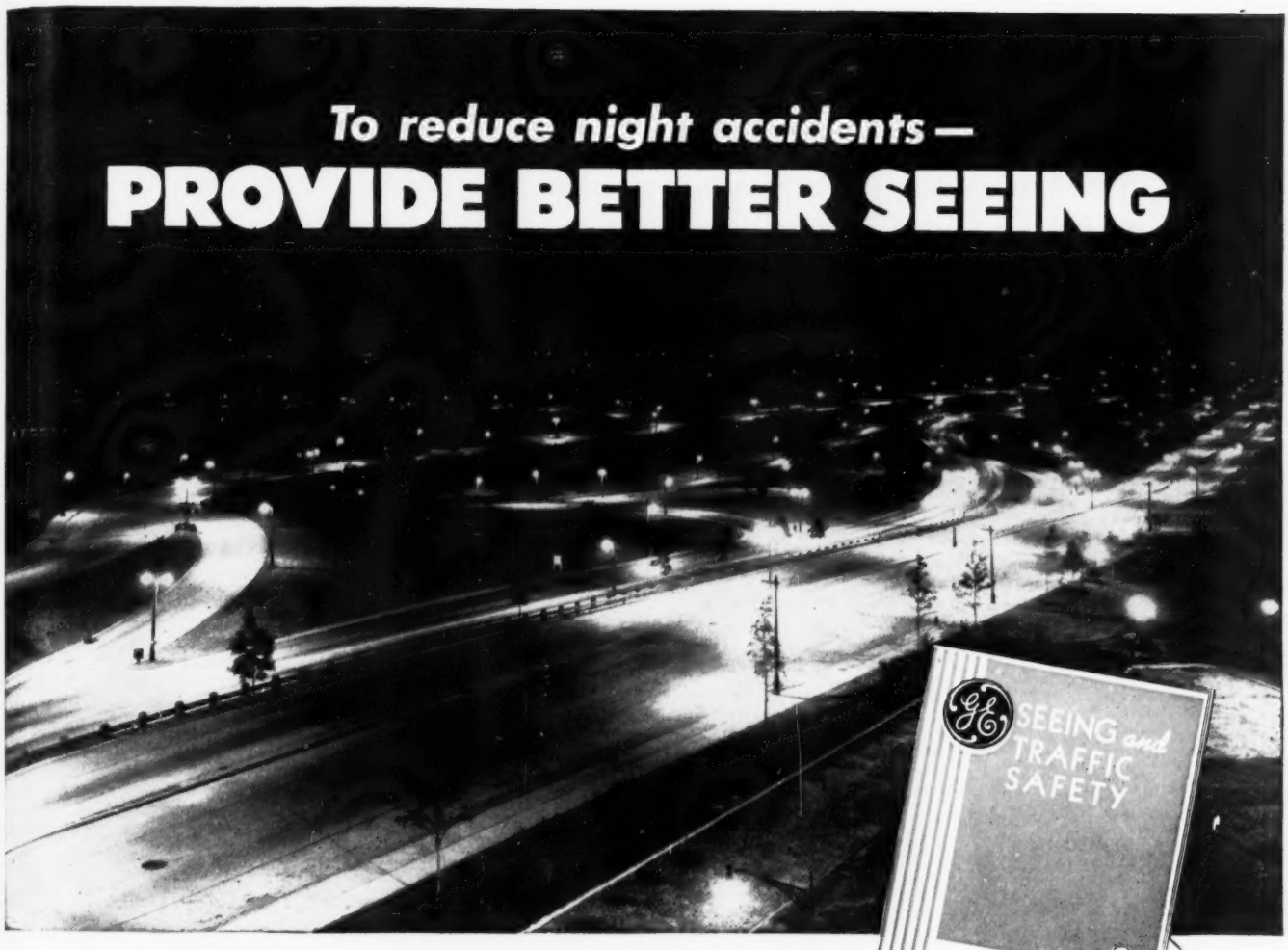
1. Genuine willingness to serve.
2. Interest in customers' problems.
3. Friendly but not too familiar.
4. Avoid obvious pressure.
5. Thorough knowledge of merchandise.
6. Ability to demonstrate merchandise.
7. Willingness to give definite opinions.
8. Handle merchandise with respect.
9. Respect for better quality goods.
10. Allow customers to look.
11. Show no disappointment at loss of sale.

Other speakers on the program included Amos Jackson, electrical engineer, Westinghouse Electric Supply Co., who demonstrated the necessity for adequate wiring; D. O. Thurman of the First Security Corp. who explained financing terms after the expiration of regulation "W" and Dr. Royal L. Garff of the University of Utah who discussed salesmanship and customer relations.

Replace Sidearms

Campaign to replace the old, relatively inefficient sidearm electric water heaters of high wattage with the large storage-tank type in Seattle is bringing fine results, according to P. C. Spowart, City Light sales manager. The campaign is being carried on cooperatively by both City Light and Puget Sound Power & Light through a dealer program in which the utility pays for plumbing and electrical installation costs. In the last 90 days more than 1,500 were exchanged.

The drive will continue to mid-March to remove and replace all water heaters of sidearm-type or of 30-gal. or less storage with 50-gal. tanks, with 3-kw. in elements, 1,000 watts of which is in the lower element. Three of such storage types can be served with the facilities that are required for one 4.5- or 5-kw. heater. The large storage capacity gives ample hot water for wash days and baths, eliminates the need for off-peak devices. There are 32,000 in use in Seattle now.



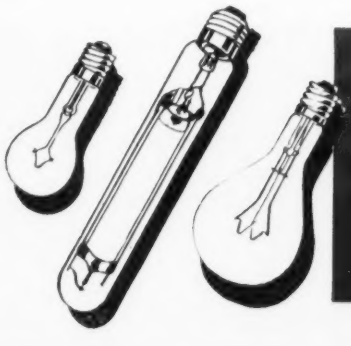
New G-E Engineering Bulletin presents latest facts on lighting for greater safety on streets and highways

MOST TRAFFIC FATALITIES occur after dark—when the rate per vehicle mile is more than 3 times that of daylight accidents. Why? Because the major night hazard is lack of adequate visibility.

What constitutes safe seeing for night driving? What is required to provide it? Too many responsible officials lack adequate information on these two fundamentals of after-dark traffic safety.

"Seeing and Traffic Safety" presents new information based on exhaustive research into every phase of visibility in night driving. It covers both automobile headlighting and fixed street and highway lighting. And it explains a practical technique developed for quantitative evaluation of street illumination.

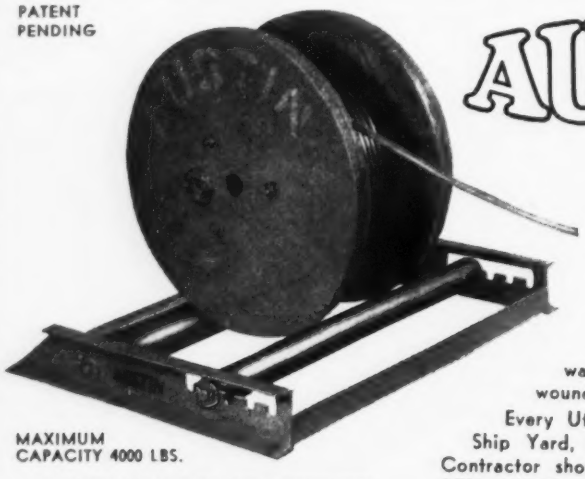
Whatever your interest or activities in relation to traffic safety, this important General Electric bulletin belongs on your "required reading" list. To get your copy, just call or write your nearby G-E Lamp district office. *General Electric Company, Lamp Department, Nela Park, Cleveland 12, Ohio.*



G-E LAMPS

GENERAL ELECTRIC

PATENT PENDING



MAXIMUM CAPACITY 4000 LBS.

AUSTIN

NO. 600 REEL ROLLER

A new quick, easy, safe way to dispense any material wound on a reel.

Every Utility, R. E. A. Cooperative, Ship Yard, Railroad, Wholesaler and Contractor should have several AUSTIN REEL ROLLERS. When pulling one or more cables into conduit use an AUSTIN REEL ROLLER for each cable. Can be mounted stationary or used on the job as a portable device—ideal for service and repair trucks.

9 OUTSTANDING ADVANTAGES

(1) Ramp—makes it quick, easy and safe to load the reel.
(2) Back roller is slightly higher, preventing the reel from being pulled off the roller when cable is removed.
(3) Reel rolls on grease packed flanged ball bearings with the greatest of ease and safety. No backlash.
(4) Thumb screw, which when tightened, prevents roller from turning for easy and safe removal of reel.
(5) Lag screw hole in each corner for stationary mounting. Hole in each side for bolting rollers together.
(6) Heavy steel frame, painted bright orange, not only adds to its appearance, but, also, makes it readily visible on the floor which helps to eliminate accidents.
(7) Five adjustable slots to take various reel diameters. No screws, washers or cotter pins to remove—simply raise up the roller and slide into the slot required.
(8) Will take any reel up to 80" in width. For larger reels, use two reel rollers and bolt together end to end.
(9) Can be used in the warehouse, on the job or truck.

PRICE $37.50 EA. NET
2% CASH 10 DAYS F.O.B. CHICAGO, ILL.
Order from Your Electrical Wholesaler

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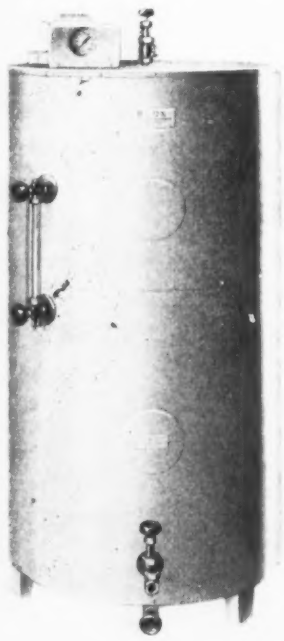
J. G. POMEROY, 1004 East 4th St., Los Angeles 13, Calif.
W. W. WHEAT & SON, 560 1st Ave., So., Seattle 4, Wash.

Announcing the New BLOX ELECTRIC STEAM ACCUMULATOR



HIGH LOAD FACTOR
LOW DEMAND
FOR PROFITABLE LOAD

AN ideal load, having unity power factor and 65% to 90% load factor. Completely electric. Fired by immersion type heating element only 2000 to 5000 watts, to suit application. The BLOX accumulator operates 24 hrs. a day, and steam is always available.

DESIGNED by a utility power engineer this efficient steam generating plant has had over 10 years use in dairies for sterilizing and cleaning, in department stores and dress shops for wrinkle removing, and similar applications. Manufacture was stopped during the war and is now being resumed by V. A. Bloxham, the original designer.

PROVIDES a clean, efficient, trouble free source of steam. Completely automatic, requires little attention in operation. The design has been improved and capacity increased.

Write to Us for Complete Information.

COAST ENGINEERING CO.
P. O. Box 710, Berkeley, California

APPLIANCE PREVIEW

Fold-Away Sunlamp (1225)

A sunlamp which folds away under the bed and features a built-in automatic timer has been designed by General Electric. This lamp uses the G-E RS sunlamp bulb. It is designed for attachment to the bed rail and has finger-tip action permitting it to be swung up and over the bed. It can be attached also to other articles of furniture. The automatic timer turns the lamp off when the desired length of exposure has been reached. A gooseneck at the top permits adjustment of the lamp. A wire guard protects the bulb.

1948 Range Line (1226)

The 1948 Hotpoint Masterpiece electric range has 33% more surface cooking capacity and newly designed Calrod coils. The bottom unit in the sealed-heat oven is concealed beneath the oven lining to give greater capacity. Automatically controlled oven temperature ranges from 150 to 550°. The 5-heat Calrod unit is smaller in actual cooking area, but increased turns of tubing give increased heat and flexibility, the announcement states. This model has the 7-qt. cooker with heating unit designed for lifting to the top as a fourth cooking unit; automatic lights to indicate heat position on top units; automatic white oven signal light; fluorescent backsplasher light; broiler; warmer and storage drawers. The apartment-size range is unchanged from the 1947 model. The 1948 line has two economy models with "sealed-heat" ovens and improved heating units.

Waffle Iron (1227)

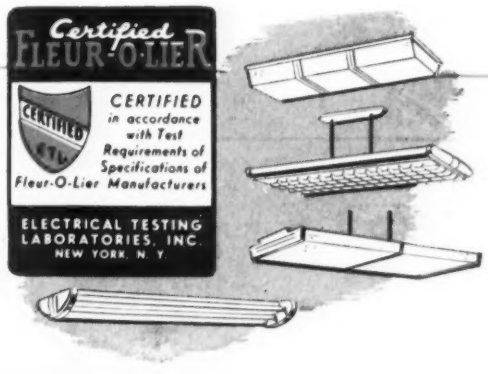
Newark Appliance Corp. is making the Gem automatic waffle iron, with built-in temperature control and washable molds. This model operates on a-c only; is Underwriters' approved.

Here's how FLEUR-O-LIER fits into PLANNED LIGHTING

FLEUR-O-LIER is a "natural" for this industry-wide program for 4 very sound reasons:

1. **It means fixtures that assure good lighting performance.**
2. **It means trouble-free operation.**
3. **Many manufacturers make FLEUR-O-LIER fixtures.**
4. **Every FLEUR-O-LIER sold swells the fund to advertise and promote Better Lighting—which is another way of saying "Planned Lighting".**

To make sure that your customers get the lighting their plans call for, it pays to recommend FLEUR-O-LIER!

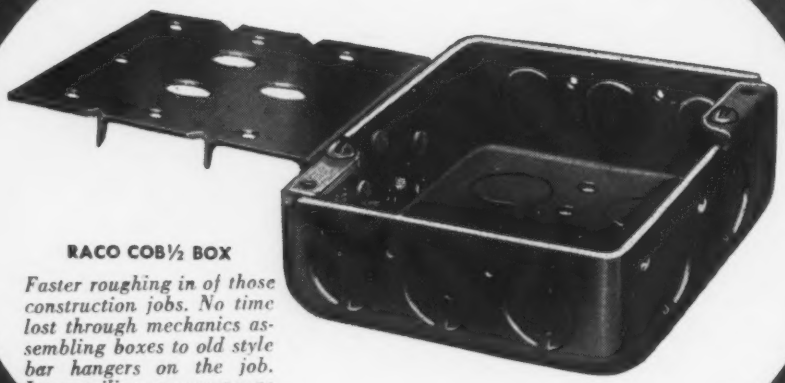


FLEUR·O·LIER

Manufacturers

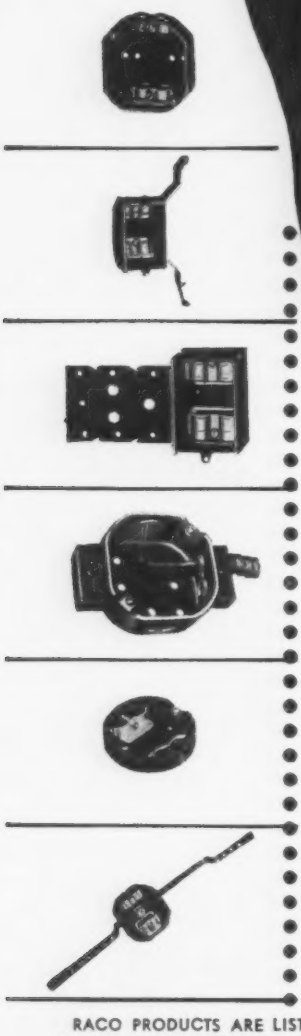
Fleur-O-Lier is not the name of an individual manufacturer, but a group of 27 leading fixture manufacturers. Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements.

A BOX FOR EVERY PURPOSE



RACO COB½ BOX

Faster roughing in of those construction jobs. No time lost through mechanics assembling boxes to old style bar hangers on the job. Long nailing prongs gauge and hold STEEL box in correct position until nails are driven.



RACO Switch and Outlet Boxes

Here's Why You Can Always Rely on Raco: There's more than 35 years' experience behind every Raco product—experience that has established the most exacting production standards—and every box is *multiple-inspected* to be sure it meets these standards. No wonder this PROFIT LINE is preferred the country over by wholesalers and salesmen, electrical contractors, builders and architects. Furthermore, there's a STURDY Raco box for *every need.* See the complete line. Send for catalog.

★ ★ ★

A-S-E STEEL PRODUCTS FOR MANY USES

STEEL OFFICE FURNITURE • WARDROBE, STORAGE, AND COMBINATION CABINETS • CLOTHING LOCKERS • INDUSTRIAL EQUIPMENT FOR FASTER MATERIALS HANDLING • FROZ-N-FOOD LOCKERS • ELECTRICAL OUTLET AND SWITCH BOXES.

You can always rely on Raco

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RACO
ALL-STEEL PRODUCTS

ALL-STEEL EQUIPMENT INC., 500 Kensington Avenue, Aurora, Illinois

A Complete Line of Switch and Outlet Boxes

ALL-STEEL EQUIPMENT INC.

Oven Eye Range Line (1228)

Electromaster has announced a 1948 line featuring faster cooking, new automatic controls and an Oven Eye. The models are Banquet Superb, Banquet Royale and Banquet Special. The Oven Eye permits inspection of the baking and roasting without opening the oven door. A switch turns on an interior oven light. The oven broiler unit has been increased to 3,000 watts.

The Vita-Miser deep-well cooker has been improved and with its 1,200-watt heating unit may be used for deep-fat frying as well as deep-well cooking. An 8-in. 2,100-watt surface unit and two 6-in. 1,250-watt surface units feature the Speedomaster monotube for faster heating and easy cleaning.

Kitchen F Light (1229)

Mitchell's new Circle-Plus kitchen luminaire combines a 32-watt Circline fluorescent bulb and a 100-watt filament bulb shielded by a white ceramic-glass bowl. Total light output is equivalent to two conventional kitchen lighting units. The incandescent operation of this luminaire lights the room the instant the switch is flicked; the fluorescent goes on a few minutes later.

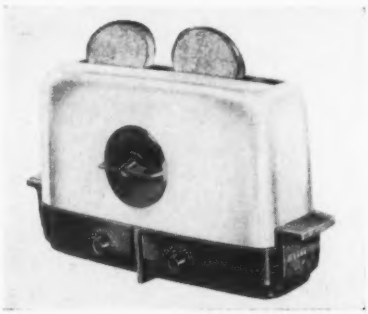
Measures 10⅞ in. in diameter, 7¾ in. high over-all. May be used only on 110-125 volts, 60 cycles a-c.

Waffle Maker (1230)

As a companion piece to its Coffeematic, Universal has a new chromium finish waffle maker with the Coronet design. The handles and trim are of heat-resistant mottled mahogany. A heat indicator tells when baking operation should be started. This 600-watt waffle iron has a 6-ft. detachable cord and may be used on a-c or d-c.

Tandem Toaster (1231)

Samson's Tandem toaster features a single slot, 10⅜ in. long, which holds two regular slices of bread end-to-end or a large single slice. It is approximately 25% narrower than most automatics, according to the announcement. A turn of a dial lowers the bread for toasting. A slide-out crumb tray, three-footed base, and handles are other features listed.



Electric Sheet (1232)

Westinghouse is making an electric sheet for use with conventional bed coverings. It is identical in operation to the warming sheet in the Westinghouse comforter, is made of neutral-colored muslin and is 70 in. wide by 84 in. long. It has a heated area 54 x 70 in. An 11-in. non-heated area is provided at the foot for tuck in. The electric sheet is spread on top of the regular bed sheets, with any blanket, comforter or other cover. Seventeen buttonholes around the outer hem of the sheet may be used for fastening the sheet to a blanket or comforter already owned. All electrical parts are completely waterproof, the manufacturer states.

Fan and Heater (1233)

Swartzbaugh Mfg. Co. is making the Everhot Model 915 combination fan and heater. It is said to circulate 80.7 cu. ft. of heated air per minute. When the lever is set at cold, the heater becomes an electric fan.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

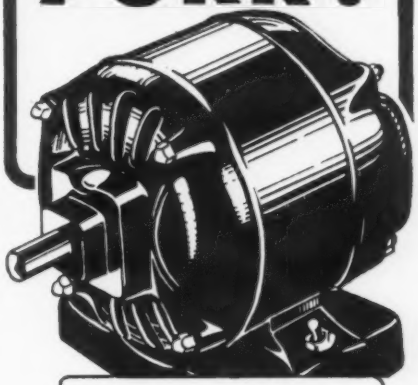
1225 1226 1227 1228 1229 1230 1231 1232 1233

Name..... Company*..... Title*.....

Address.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

WHAT MAKES A MOTOR PURR?



"WHY, PROPER COMMUTATION OF COURSE!"

OHIO MOTOR BRUSHES ARE THE ANSWER...

COMMUTATION is the most important function of a motor brush. Obviously, conditions encountered below earth level, at earth level, or in the stratosphere will effect proper commutation. Location, humidity, temperature, dust and fume conditions, over-load and under-load are as important as the machine itself. *Identical motors and generators often do not give identical performance.* Address your COMMUTATION Problems to our Engineering Staff.

BUY YOUR CARBON BRUSHES FROM A SINGLE SOURCE

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TRI-STATE SUPPLY CORP.
LOS ANGELES
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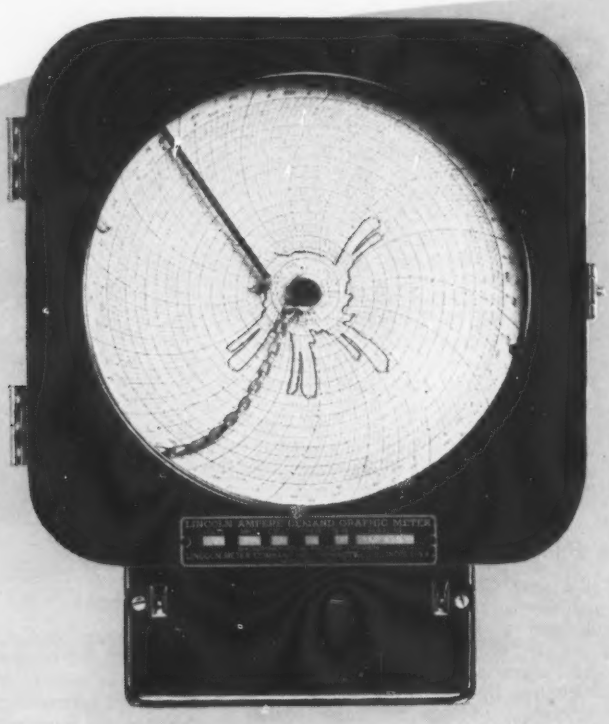
DEMAND MEASUREMENT

SANGAMO

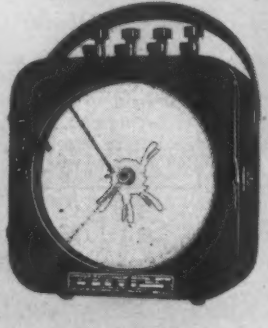
DEMAND INSTRUMENTS

To be sound, rates must compensate for all costs, should develop profitable markets, should not be discriminatory, and should be applicable to loads widely varying in character. Best rate design is based on facts. Only measured facts are known facts. Sangamo Lincoln-Type Graphic Demand Meters provide accurate information as to the magnitude of demands, the time at which the demands occur, and their duration. Other Sangamo Demand Instruments are available in an extensive line—designed for your particular needs.

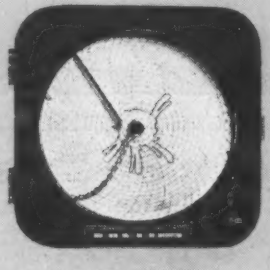


TYPE CCW
(with terminal chamber on bottom)

Sangamo Lincoln-Type CCW Graphic Demand Meter provides an accurate, reliable, and economical means wherever a record of the time and duration, as well as the magnitude, of demand is required. A wide variety of indicating instruments is also available.



TYPE CCW
(Portable)



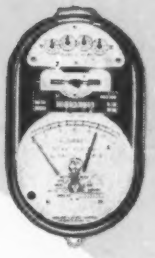
TYPE CCW
(Switchboard)

Sangamo Lincoln-Type CCW Portable and Switchboard Graphics are, respectively, top connected for temporary or test installations, and back connected for panel mounting.

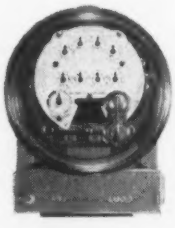
gives facts for designing rates

choose from this extensive line the meters best suited to your rate structure...

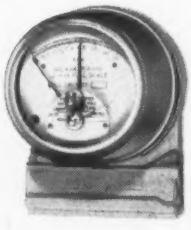
TYPE JS WITH JG DEMAND REGISTER



TYPE JWS



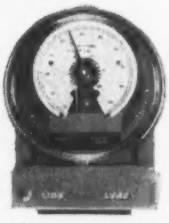
TYPE JA WITH JGC DEMAND REGISTER



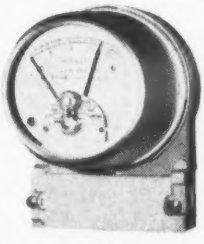
TYPE VAP

TYPE LCS WITH LG DEMAND REGISTER

TYPE LCP WITH LG DEMAND REGISTER



TYPE AG CONTACT OPERATED



TYPE WDP

TYPE WDS

TYPE AD

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

SM 671

THE MONTH IN BRIEF

Utah's 1970 Power Market

Utah's 1970 power requirements are estimated at 892,000 kw. installed capacity and 4,285,140,000 kwh., in a report by FPC in cooperation with the Colorado River Committee. Existing net capacity is given as 185,614 kw. installed and 982,346,000 kwh. Twelve plants in proposed Colorado River development would have an installed capacity of 788,100 kw. with annual output of 3,766,300,000 kwh. in an average water year and 2,591,800,000 kwh. in a dry year, leaving an estimated 120,000 kw. in new steam-electric capacity required. Total cost of 12 projected plants on the Colorado would be about $453,911,000, including costs chargeable to irrigation and other non-power uses. About $105,966,000 would represent direct power costs exclusive of transmission, it is reported.

Provo Approves Revenue Bonds

By a vote of 2,544 to 2,176, Provo, Utah, voters approved a revenue bond issued for additions to the city power plant. Elmer Jacobs, superintendent, said the $1,250,000 authorized would be spent in enlarging the city's coal-steam generating plant from 6,500-kw. to 14,000-kw. capacity. Opponents of the bond issue claimed that Utah Power & Light Co. rates for the first 100 kw. are less than those of Provo and that the power company had said that it could furnish power to the city at the same or less than it was costing Provo to generate it.

New Steam Plant at El Centro

Imperial Irrigation District in California has started construction of a 20,000-kw. steam plant at El Centro, first unit in a development for which $6,200,000 in bonds was approved in 1945. C. W. Elliott Co. of San Diego is contractor for the substructures, water storage basins and subsurface facilities, which will cost $442,574. Plant engineer is Gibbs and Hill, New York. The El Centro plant will serve as a stand-by for the valley system. Also scheduled is an additional 12,500-kva unit at an existing plant.

Harbor Plant Addition on Line

Adding 87,250 hp. to the Los Angeles municipal power system, unit No. 2 at Harbor steam plant in Wilmington was put into operation on Nov. 13. The $1,115,000 unit is part of an addition ultimately to cost about $7,500,000. Construction is well under way on a second addition to the building to house three turbo generators, each with a capacity of more than 100,000 hp. The generator went into service just before the city's winter peak, expected to reach 680,000 kw. in December. Wartime peak in 1944 was 654,000 kw.

Pepco Reorganization Confirmed

Formal confirmation of the Pepco reorganization plan by Federal Judge J. A. Fee at Portland was expected to end the eight-year proceedings. Only possible obstacle was a petition filed in the U. S. Supreme Court Oct. 4 by four first preferred stockholders, seeking writ of certiorari. Under the reorganization plan, Pepco is dissolved and its securities exchanged for stock in Portland General Electric Co., chief Pepco subsidiary. New securities to be issued under the plan were to be available this month.

Power Company Sells Bus Lines

Puget Sound Power & Light Co. has sold its subsidiary North Coast bus lines to Greyhound for a price "in excess of $3,000,000." Frank McLaughlin, Puget Power president, said the sale was necessary to help the company finance its $8,000,000 electric construction program in 1948. He also pointed out that the PUDs, acting separately, cannot under law take over the bus property in the event they succeed in acquiring the electric properties.

Bremerton Franchise Granted

Bremerton, Wash., city council has granted a ten-year non-exclusive franchise to Puget Sound Power & Light Co., which had been operating for some time without franchise.

PUD Takes Properties

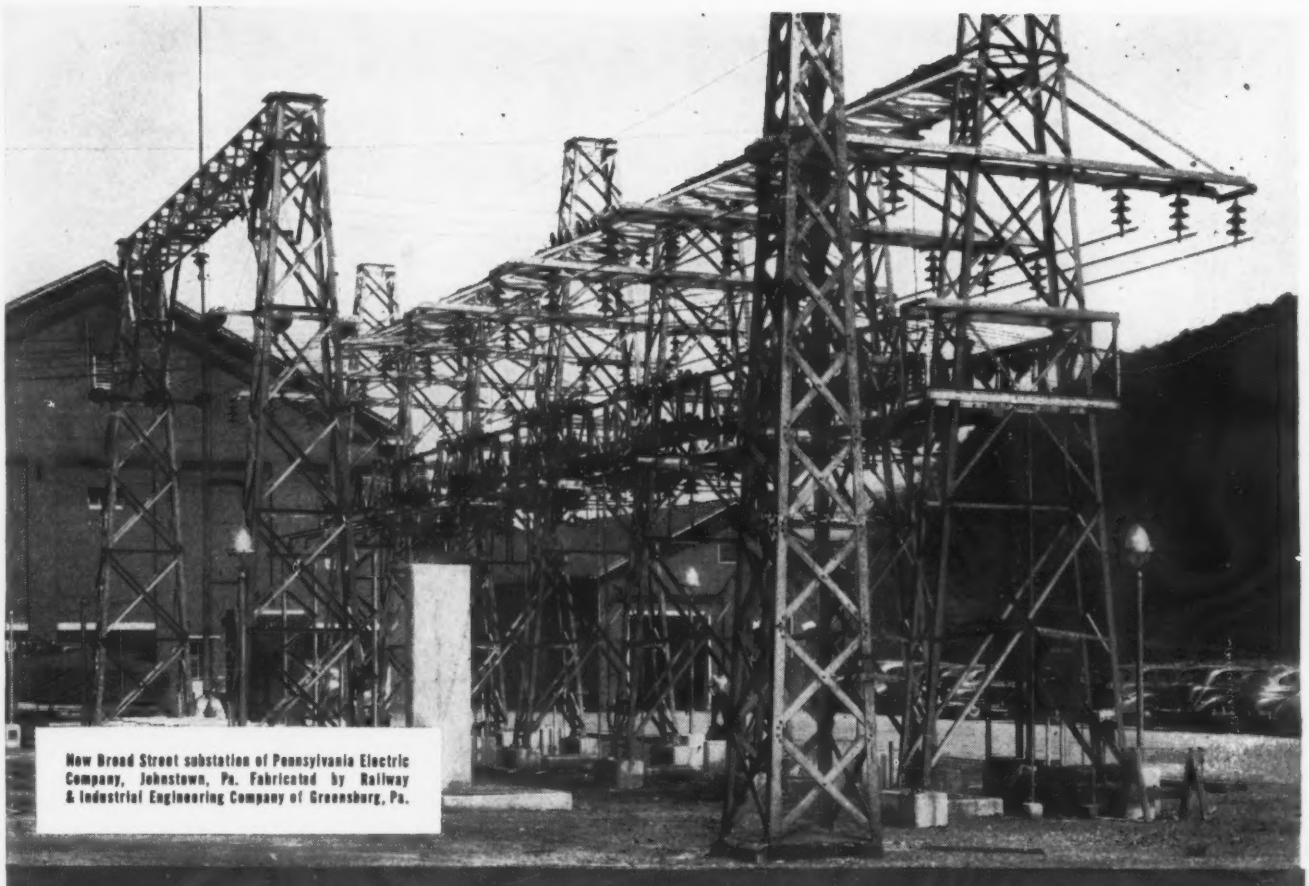
Franklin County PUD, Pasco, Wash., has taken over management of Pacific Power & Light Co. facilities in the county, following payment of the $1,200,000 condemnation award, plus $21,061 improvements and $413 costs. To finance the purchase, the PUD sold $1,525,000 in revenue bonds to Ballard-Hassett Investment Co. of Des Moines. Harry Hudlow has been appointed manager, succeeding H. DeSchepper. Hudlow was former manager of the Big Bend co-op at Ritsville, Wash.

New Rate Reverses Sliding Scale

Soak the rich is an old socialist slogan. Time was when municipal ownership was offered on the platter of lower rates, but Palo Alto's city system recently reversed the process—it raised its rates for domestic service on a sliding scale that penalizes a person for using more electricity. Perhaps it is motivated by the socialistic concept that if a person is plutocrat enough to afford a range and water heater he ought to pay more for his electricity. A person using about 1,200 kw. per month now has to pay about 27% more than he did under the old rate. The more used, the worse it gets.

Larger-Size Water Heaters

Large-size commercial water heaters have proved such a success in Seattle that City Light is having some 200-gal., 30-kw. tanks built to try out. Previous models have been 100-gal. size. The 200-gal. tank is as large as will go through a standard door, with lagging and case removed. It will have six 5-kw. units which go on in steps, cut off during peaks, and operate on the ¾c rate. Experience shows these large tanks give a much-needed service to apartments, hotels, and business houses, and improve load factor.



New Broad Street substation of Pennsylvania Electric Company, Johnstown, Pa. Fabricated by Railway & Industrial Engineering Company of Greensburg, Pa.

ALL-ALUMINUM SUBSTATIONS

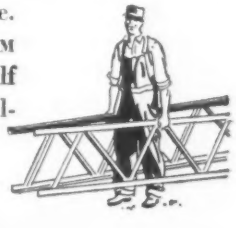
cut erection time 75%, maintenance cost to zero

In only 14 working hours, a 5-man inexperienced crew working without a crane, erected the strong, lightweight Alcoa Aluminum supporting members of this all-aluminum substation. It would have taken at least a week to 10 days' time, and a crane, to erect a similar structure built of ordinary heavy metal.

And there will be no periodic shutdowns of the electrical circuits in order to paint the structure. Aluminum cannot rust, needs no paint or protection even in industrial atmospheres.

Alcoa Aluminum Tubular Bus make up the electrical circuits of this substation. They're a special electrical grade of aluminum that gives high current-carrying efficiency. You have your choice of Alcoa Aluminum Bus Conductors in many sizes, and four shapes . . . tubular, channels, angles, and flat bars. There are Alcoa Aluminum Fittings for each size and shape.

Design your substations "ALL-ALUMINUM" . . . to save time, money, inconvenience. We'll be glad to help. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in leading cities.



MORE PEOPLE WANT MORE ALUMINUM FOR MORE USES THAN EVER

ALCOA ALUMINUM

IN EVERY COMMERCIAL FORM

All electrical systems are "SUBJECT TO CHANGE"

Electrical distribution systems ought to be tagged "Subject to Change."

For it's a rare installation that doesn't have need for replacements, removals or additions among existing circuits—sooner or later.

You can give your distribution system a headstart that helps lick these problems by specifying BullDog Vacu-Break Switchboards. These modern distribution control centers feature flexibility, convertibility and ample provision for any and all future expansion.

Front-operated switch units embody the unique Vacu-Break principle to smother arcs quickly and safely, preventing burning and pitting of contacts. And BullDog's self-aligning "Clampmatic Contacts" provide bolt-tight pressure to assure high conductivity, low heat losses, longer life and less maintenance.

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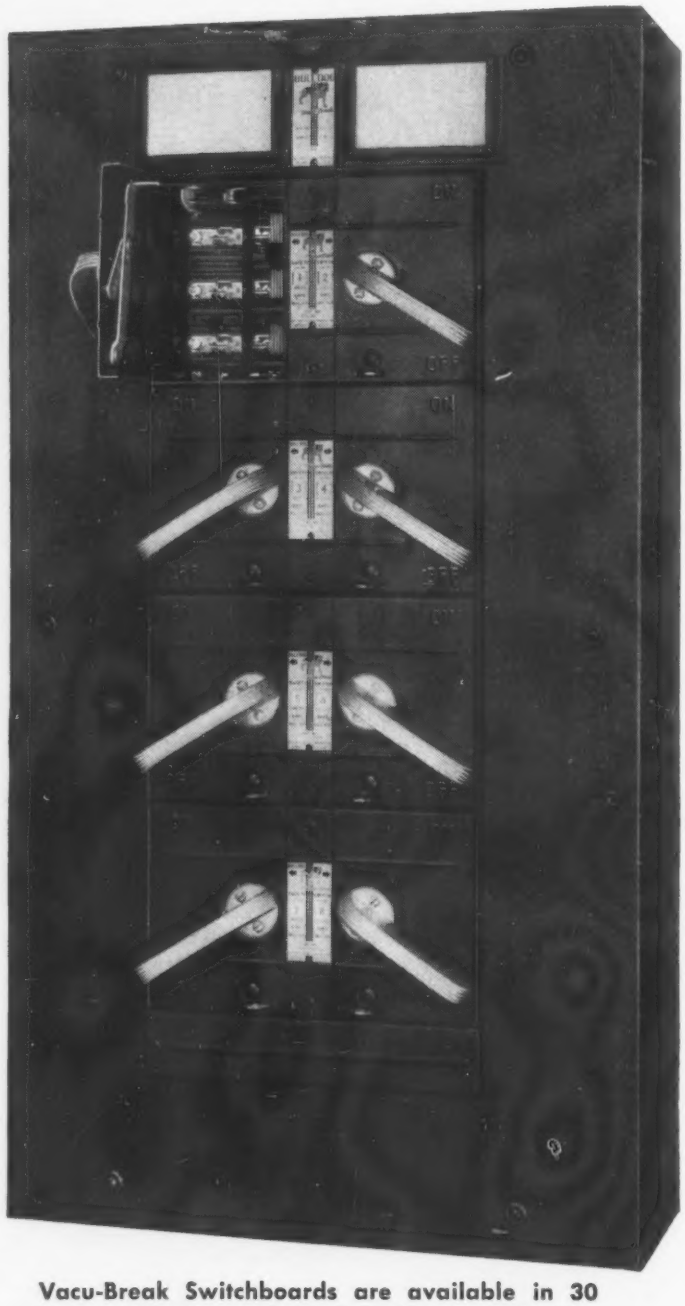
Act now to eliminate inefficient "ganging" of switches on makeshift racks. Our nearby field engineer will explain BullDog Vacu-Break Switchboards and their marked advantages in flexibility and performance. Call him today, or write BullDog direct for descriptive literature.



Vacu-Break Switchboards are available in 30 Amp. to 600 Amp., 2 & 3 Pole Circuits, 575 Volts and less.

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Portland, Oregon

Safety Switchboard Company
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San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles, Calif.

POLITICAL ACTION—
Labor's Blind Alley

THE approach of the 1948 elections brings organized labor in America to a fork in the road.

Straight ahead lies the familiar route of free collective bargaining. Except for an occasional side trip, labor has been traveling it for years. On this road the role of government is to act as traffic cop, removing obstructions for all travelers.

The fork is the road of political action—the road to special privilege for labor. On it government is called upon to clear a special right of way for organized labor—to push aside all others.

Which of these two roads will organized labor take?

Most American labor leaders are now urging their followers toward political action. Their first objective is to "get" all members of Congress who voted for the Taft-Hartley Act. AFL plans to raise a $5 million political combat fund through contributions and a per capita tax on its membership. CIO is soliciting $1 donations for political action from its 6,000,000 members.

For their own sake, however, as well as for the welfare of the country as a whole, the rank and file of organized labor will do well to stop, look and listen before they turn their unions into political action squads. If they examine the facts for themselves, they will make two significant discoveries:

I. Political action is a blind alley for labor.
II. The Taft-Hartley Act is an essential bulwark of free collective bargaining.

A brief discussion of these two statements will show what they mean to organized labor.

I

Political action is a blind alley for labor.

If there is any doubt about that statement, a good way to dispel the doubt is to look at European countries where organized labor has been following a political action line.

Britain, where the Labor Party is in power, is such a country. How is labor faring there? Measured by the good things money buys, the average hourly wage in Britain is less than two-thirds of what it is in the United States. Part of the difference may be accounted for by the fact that the British Isles are poorer in natural resources than the United States. Another reason is the war damage to Britain's plants.

But there are two other big reasons why the British wage earner is far behind the American worker in enjoying the good things of life:

1. The *incentive to produce* has been dulled by vote-catching programs which promise economic security and a levelling of incomes. Lulled by promises of cradle-to-the-grave security and discouraged by high taxes, the British have descended to a state neatly described by the London *Economist:*

"Nobody gains anything from activity or suffers anything from inactivity."

2. To run a program like Britain's requires more and more government functionaries. Civilian employees of the British government have increased by 50% since before the war, putting one worker out of ten on the government payroll. More and more people stop producing and spend their time instead cutting up what others produce. The result is smaller production, higher taxes and lower real wages.

The British Labor Party must accept most of the responsibility for this sorry state of affairs. It is due primarily to a program of political action by organized labor which promised the individual worker security and equality of income—*but which can not deliver either because the incentive to work is gone.*

The lesson for American wage earners is clear. Political action by unions to enforce the economic fallacy of more-and-more-for-less-and-less will end by impoverishing the working man—and bringing the nation to ruin.

Unions exist for collective bargaining, not for politicking.

II

The Taft-Hartley Act is an essential bulwark of free collective bargaining.

Bargaining works satisfactorily only when both parties—management and labor—think they are getting a fairly even break.

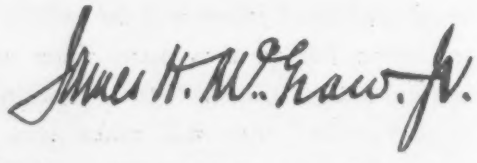
Management was very sure that the Wagner Act, as administered from 1935 to 1947, was giving employers the short end of the stick. Furthermore, management's feeling of frustration was no whim. It was justified by case after case where rights were granted to organized labor with no counterbalancing recognition of the rights of management, of individual workers or of the public.

The Taft-Hartley Act goes a long way toward establishing equality in employer-union relations. It may fall short of doing a perfect job. *As a subsequent editorial in this series will show, it leaves virtually untouched the public menace of industry-wide bargaining and labor monopoly. And it leaves unprotected what should be the individual's right to hold a job without joining any particular organization.* But it *does* provide some major safeguards for collective bargaining by striking at abuses.

Organized labor, therefore, has no cause to damn the members of Congress who voted for the Taft-Hartley Act. True, the law will check what has been an uninterrupted march of the labor union bosses toward absolute power. It will do so just as laws in the past—The Sherman Anti-Trust Act, for example—have checked management when it was too greedy. And, as the first section of this editorial points out, the time has come to check the march of the big labor bosses.

Fundamentally, the Taft-Hartley Act gives free collective bargaining a new lease on life. The old lease was running out because the Wagner Act stacked the cards against employers, against individual workers, and against the public.

The road to free collective bargaining is now clear of many of the most menacing obstructions. It is the only road for labor to take in its own self interest. Union workers who let their leaders lure them down the blind alley of political action will do so at their own peril—and at the peril of this great industrial nation.



President, McGraw-Hill Publishing Company, Inc.

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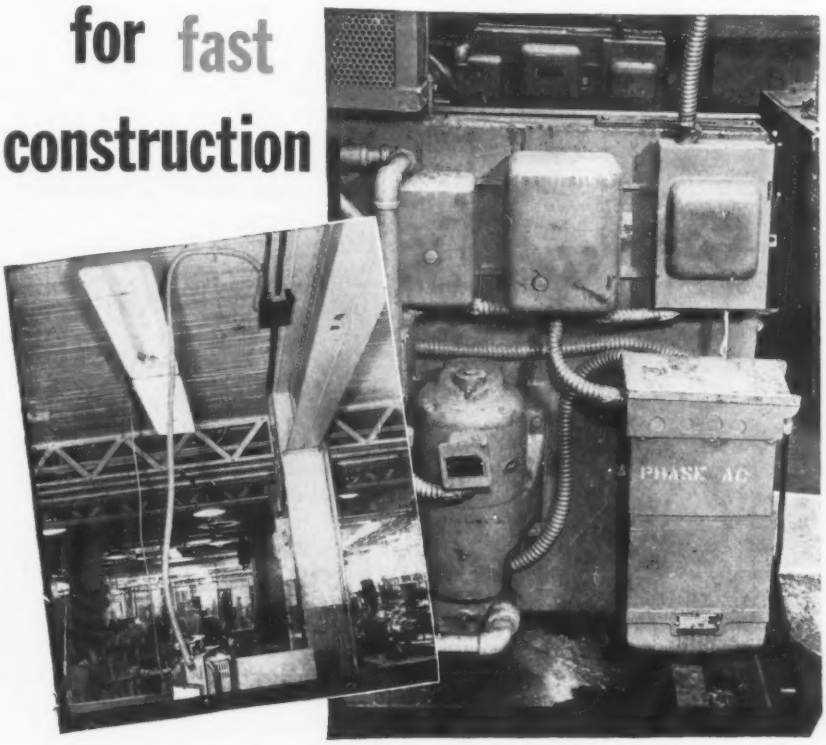

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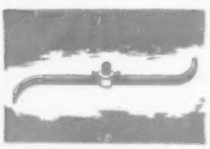

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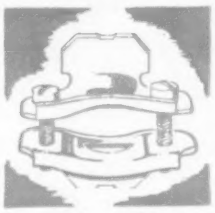

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THIS MONTH'S NEWS

Pacific Power Installing Another Unit at Ariel

A second 50,000-kw. generator will be installed in Pacific Power & Light Co.'s Ariel Dam power house on the Lewis River in southwestern Washington.

The project, to cost approximately $3,000,000 will be the first major hydroelectric generating facility installed by private interests in the Northwest since the federal government began its Columbia River power development program more than ten years ago.

The Ariel development, started in 1929, was designed for four generators. The project, as then proposed, called for construction of up-river dams to store sufficient water for year-round operation. This plan was abandoned as economically unfeasible when government dam construction was begun, and only one generator was installed.

Now, however, the power picture in the Pacific Northwest makes it desirable to install the new unit, Paul B. McKee, president of Pacific Power & Light, said.

Although present water storage in the Lewis River is insufficient to operate two generators at the dam throughout the year, engineers report that use of the new installation will enable the plant to carry peak loads during the daily hours of heavy power use, permitting Pacific, and its affiliate, Washington Water Power Co., to make more efficient use of power purchased from Bonneville.

The dam's power house has space for the new generator and transmission line capacity can be increased by stepping up operating voltage from 66,000 to 110,000 volts, according to engineers' studies. It is estimated that power developed in one year by the new generator will be equal to that which could be produced by burning 200,000 barrels of fuel oil.

● INSTALLATION of a 1,250-kva. turbo-generator, scheduled to be placed in operation around Christmas, will step up capacity of the Durango, Colo., steam plant to 2,500 kva., according to Western Colorado Power Co. officials. To increase efficiency of the new steam turbine, the last of the plant's three boilers is being reconditioned and converted to burn natural gas and fuel oil. The first two boilers were converted from coal last year when a 625-kva. turbo-generator was put into service.

● SEWARD, Alaska, voters have approved two propositions totaling $171,360 for financing an expansion of the municipally owned power plant. One $90,000 issue of general obligation bonds will buy a 300-kw. diesel-engine generator, expected to double the capacity of the plant, while a similar issue in the amount of $81,360, will refund revenue bonds on the plant, originally financed by the RFC.

Eugene Municipal To Add 50,500 kw. in Capacity

The Eugene, Ore., water board has announced plans to increase the city's power capacity to 50,500 kw. by 1950. It will place an order in the near future for a $386,000 generating unit for the old Walterville plant, replacing the present 3,000 kw. with 8,000 kw. Peak load for the present system has been approximately 28,700 kw.

A contract for a $195,400 turbine has been awarded with contingencies to the Baldwin Locomotive Co. and one for $190,616 for a 11,500-volt generator to the General Electric Co.

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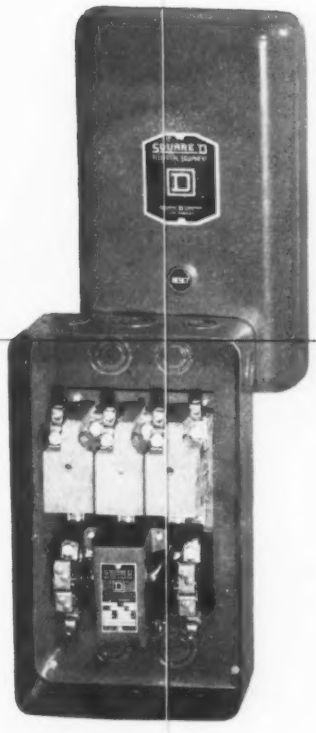

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with the use of minimum tools.
current carrying parts are mounted
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HYDEE HANGER*
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Complete with receptacle, two 5-foot chains, "S" hooks and cord clips. Fits standard 4" or 3¼" outlet box or plaster ring. Self-grounding—regular 2-wire cord and plug may be used.
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PACIFIC'S CLARK COUNTY PROPERTY VALUE ARGUED

An estimated value of $5,064,918 has been placed on Pacific Power & Light Co.'s properties in Clark County, Wash., by Henry L. Gray, Seattle consulting engineer, testifying in condemnation proceedings instituted by Clark County PUD.

That figure was based on "reproduction new" of the system. Edward S. Clemons, Portland, engineer testifying for the PUD, said that the book value of the properties as of September 1947, obtained from company records, was $3,476,996.

Salem Council Studying Co-op Franchises

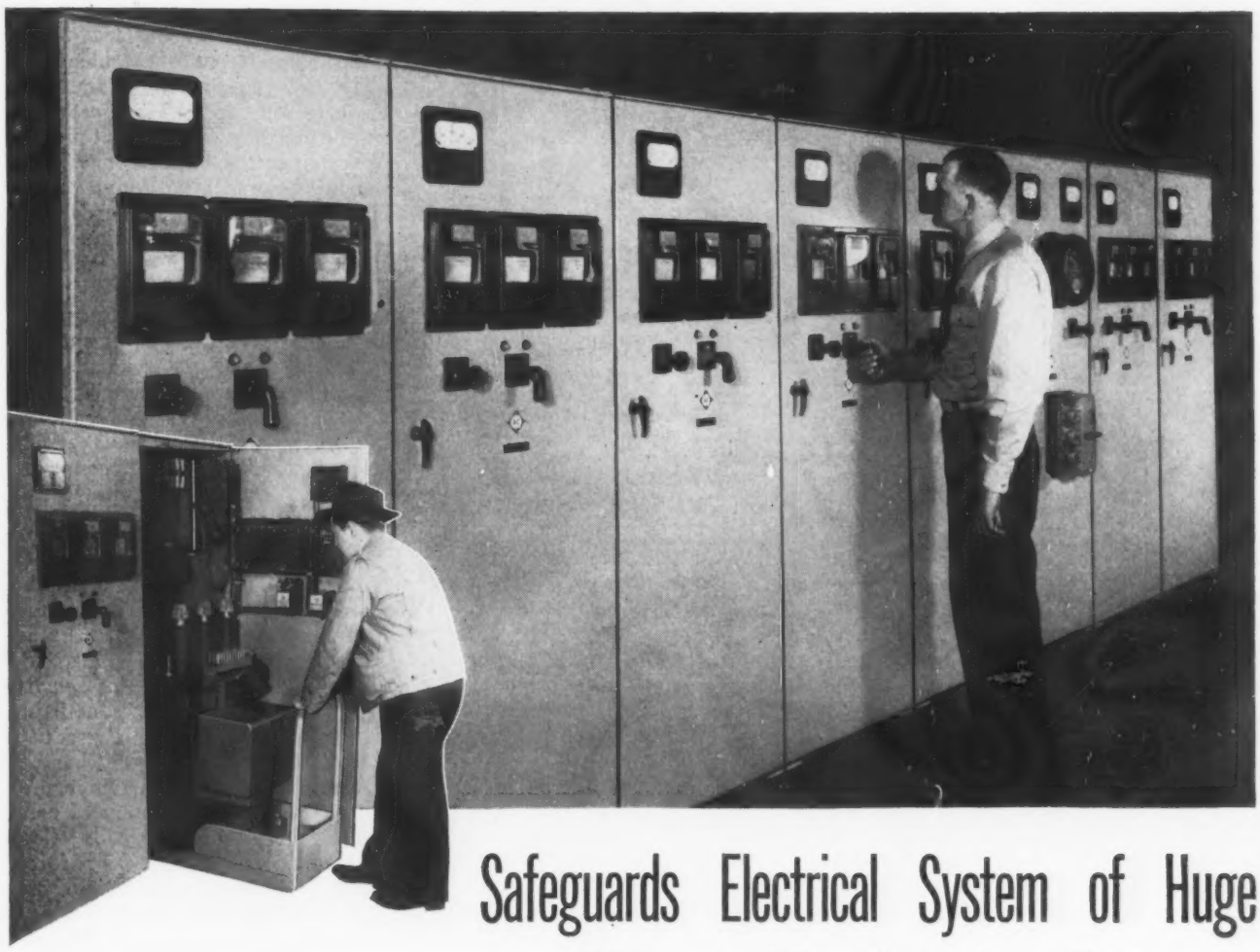
Two ordinances granting franchises to Salem Electric, cooperative utility, are before the Salem, Ore., city council. One proposes a limited franchise covering the area now served by the utility. The other provides a general franchise, which is desired by the co-op.

In 1940 the company received a permit to set up 20 poles to serve an area of 22 blocks. Twice since then voters of Salem have rejected proposals to grant the co-op a franchise. The first time was in February 1945, when a proposal to grant the company a general franchise was defeated by a narrow margin. In June of the same year the voters rejected a franchise extending the area of the cooperative's operations to 30 blocks, covering virtually all of the busines area of the city.

● A Washington state PUD may join and financially support a regional organization which extends beyond the district's geographic limits, State Attorney General Smith Troy has ruled. F. A. Stewart, managing director of the PUDs, had asked the attorney general if districts could join and support a regional public utility information and research service which also would include municipalities and rural electrical associations.

● Long Beach, Calif., city council has authorized a new contract drawn with Southern California Edison Co. similar to one which expires Dec. 31, 1947. Because the Edison company is the only qualified bidder, City Attorney Irving Smith ruled that the council should not advertise for bids on furnishing the city with electric light, heat and power in 1948. The city has the lowest electric rates of any municipality in California.

METAL-CLAD SWITCHGEAR ON GUARD!



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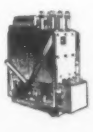
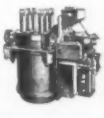
MAGNETIC AIR. A-C trademark *Ruptair*. Capacities: 50,000 to 250,000 kva.



OIL — A-C trademark *Ruptor*. Interrupting. Capacities: 50,000 to 500,000 kva.



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BOOKLET GIVES FARMERS SAFETY SUGGESTIONS

The California Department of Industrial Relations recently released a folder urging caution in working near power lines, illustrating a few of the more common types of accidents involving high-voltage conductors.

Farmers were warned against careless use of metal poles for fruit-picking or spraying equipment that may brush power lines. Contacts with high-voltage lines running through orchards have recently resulted in five serious accidents and three fatalities in the state.

The bulletin also stressed the importance of a 6-ft. margin between power lines and any type of equipment that may move or be moved, such as cranes, derricks, well drilling apparatus, construction towers and scaffolds. It quoted the state penal code section which makes it a misdemeanor to place, move or erect machinery or buildings within 6 ft. of a high-voltage overhead conductor.

● To Encourage Subcontracting by Western industrial plants for manufacture of parts to supply large manufacturing concerns that might be attracted to California, the Los Angeles Department of Water & Power is assisting the University of California graduate school of business, the State Chamber of Commerce and local chambers of commerce to index the names of companies, type of work they do, floor space available, size of labor force, products they make, percentage of machine capacity now utilized and whether they would handle extra work if offered. Machine tools are listed and other pertinent production data as well. Similar indexing helped materially in speeding war production and gave work to many small industries in the area.

● A Contract to provide power for chemical manufacturers operating in the $140,000,000 plant of Basic Magnesium Inc., at Henderson, Nev., has been approved by WAA. Under the contract with the Los Angeles Bureau of Power & Light and the Southern California Edison Co., effective on acceptance of certain minor conditions by the power suppliers, the Edison company assumes payment of full operating costs of power units known as N-7 and agrees to pay accrued rentals amounting to $183,081. The contract will run until May 31, 1951.

● Washington Utility Commissioners Assn., Seattle, has changed its address to suite 404, in the 1331 3rd Ave. Bldg. These offices were formerly occupied by the Seattle office of the Bonneville Administration.

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Saves You Money...

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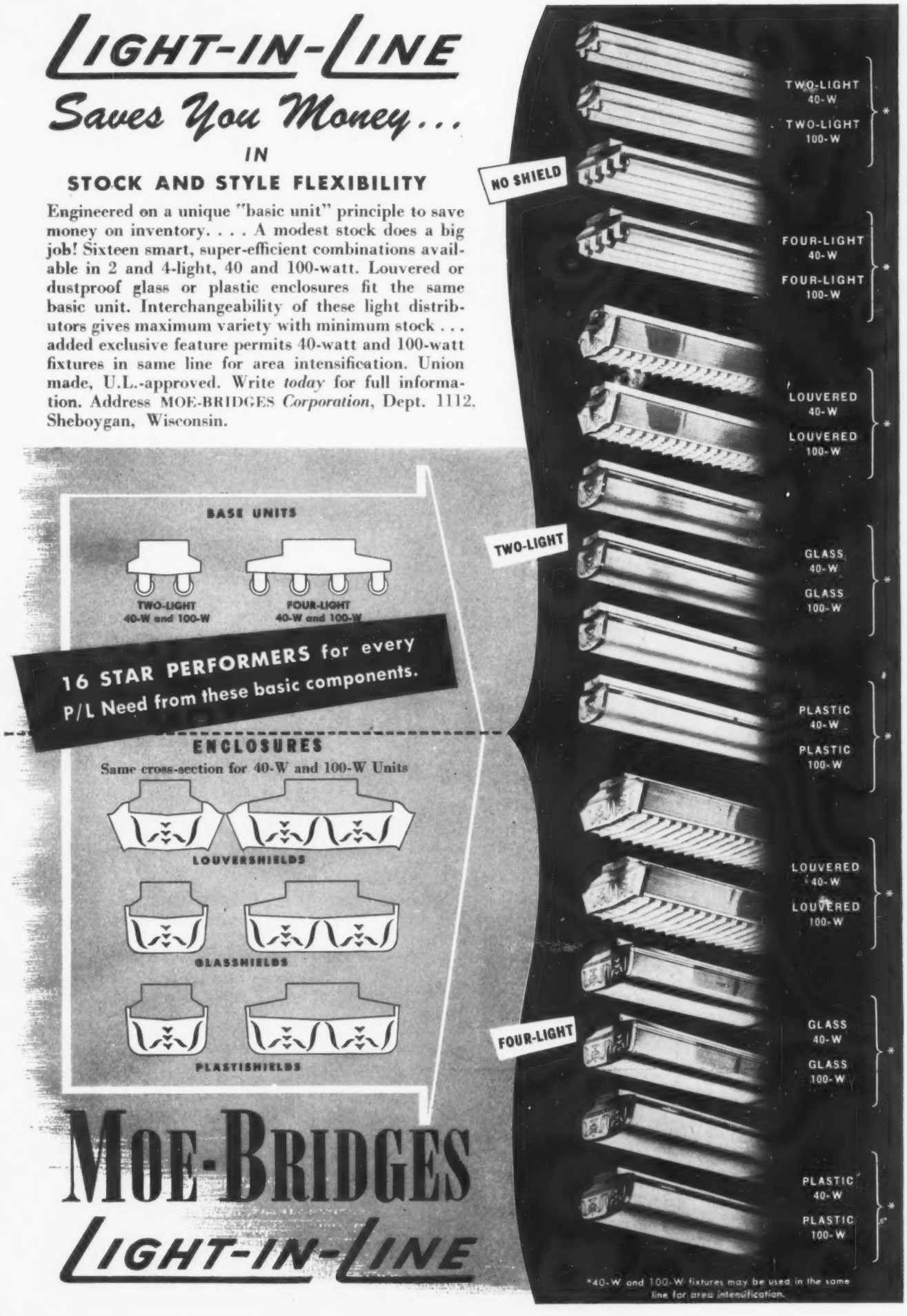
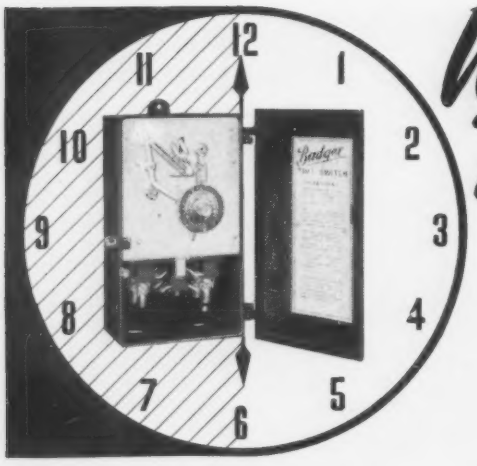


MOE-BRIDGES

LIGHT-IN-LINE



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- Standard or 2-Circuit
- Plain or Astronomic
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● Reliance Time Switches — our customers tell us — are well-named. Many say our standard electric time switches meet practically all of their automatic control requirements. Some users have enjoyed dependable Reliance service for more than 35 years. You, too, can rely on the Reliance line. Ask your distributor or write — Reliance Automatic Lighting Co., 1939 Mead St., Racine, Wisconsin.

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NEWS ABOUT PEOPLE

Reid Gardner is Arizona Edison Co. President

Appointment of Reid Gardner, Phoenix, to succeed the late Phillips B. Shaw as president of the Arizona Edison Co. has been announced by the utility's board of directors.

At the same time it was announced that Douglas B. McGregor, Phoenix, had been elected executive vice-president. Gardner previously had been vice-president and operating manager of the company and McGregor vice-president and treasurer.

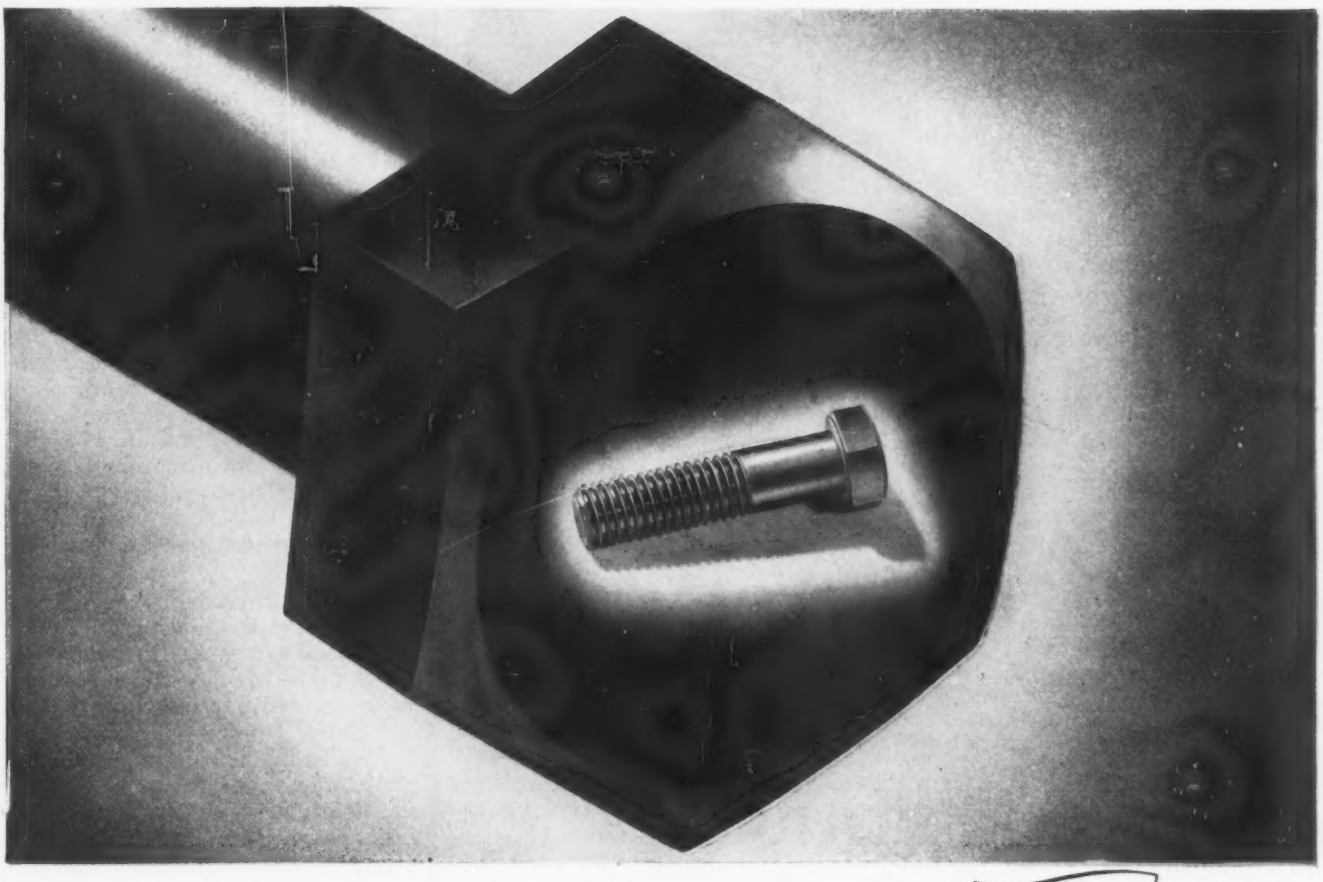
Gardner entered the utility field in 1924 in the general office of the Michigan Bell Telephone Co., Detroit. While there he worked on rate and training matters and later was appointed division commercial supervisor at Saginaw, Mich. He went to Cedar City, Utah, in 1930 as assistant general manager of Southern Utah Power Co., was elected vice-president and general manager in 1931 and in 1942 was named president and general manager. He was elected president of the Utah Electrical Assn. for 1947, but resigned the position to join Arizona Edison early this year.

McGregor has been associated with the Arizona company for 17 years. He started in accounting department in 1940, became chief clerk of the general offices in 1933 and later was promoted to assistant secretary and assistant treasurer. He was named treasurer in 1937 and vice-president in 1942.

● W. L. WINTER, sales engineer for Westinghouse Electric Corp., San Francisco, has been elected president of the Engineers Club of San Francisco. Other officers chosen include D. A. Stivers, Wells Fargo Bank and Union Trust Co., treasurer; and J. A. Polhemus, Standard Oil Co. of Calif., secretary.

● APPOINTMENT of R. K. FOLEY as publicity supervisor and of ROY N. VERNSTROM as advertising manager of Pacific Power & Light Co. was announced recently by John Dierdorff, vice-president in charge of public relations.

● ED SHARPE, senior electrical engineer for Frederick R. Harris, Blanchard & Maher & Keller & Gannon, contractors, has been transferred to Guam.



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It's the cost of *using* a fastener that counts. Wherever maximum fastener strength is required . . . such as for engines and machine tools . . . it is *T*rue *F*astener *E*conomy to specify high-quality Cap Screws.

R B & W *Cap Screws for Utmost Security*

Raw material that is subjected to the most rigid mechanical and physical examination . . . cold-forming on the most modern machinery . . . continuous inspection at every stage of manufacture . . . contribute to your assurance that RB & W Cap Screws will have uniformly high physical properties and a finish that enhances the appearance of the finished product.

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2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
4. Reduce the number and size of fasteners by proper design
5. Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners
6. Simplify inventories by standardizing on fewer types and sizes of fasteners
7. Save purchasing time by buying larger quantities from one supplier's complete line
8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

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102 years making strong the things that make America strong

RB&W bolts, nuts, screws, rivets and allied fastening products are manufactured in a broad range of styles, sizes and finishes.

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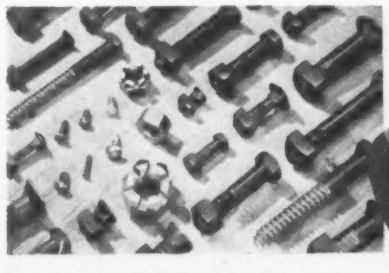
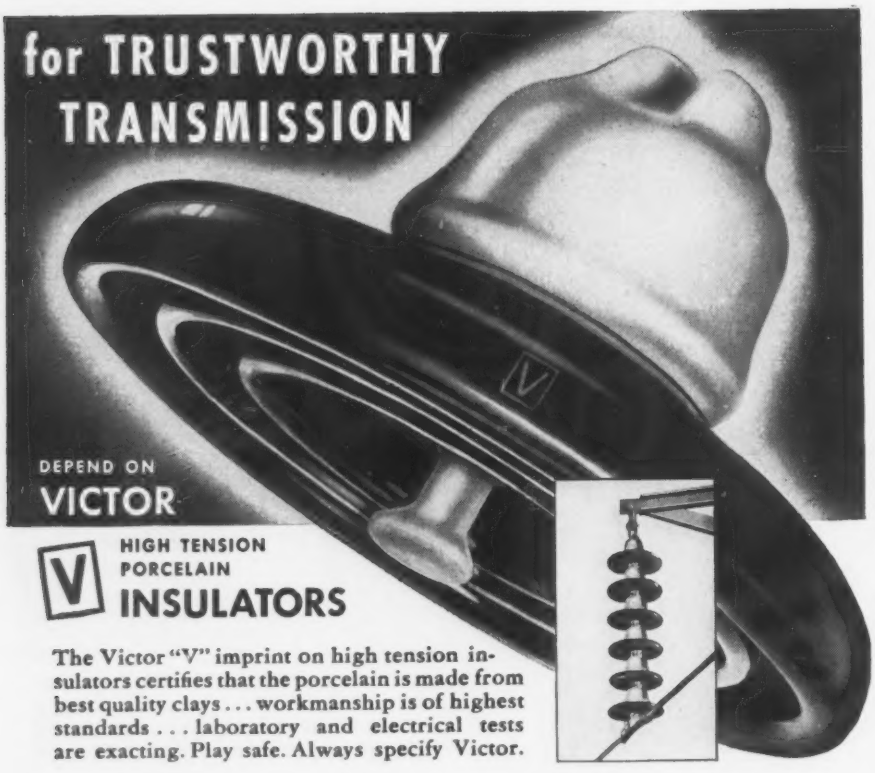


for TRUSTWORTHY TRANSMISSION



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WHATEVER YOU USE ON A REEL . . . WIRE, CABLE OR ROPE . . . SAVE TIME AND LABOR WITH

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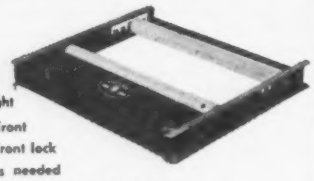

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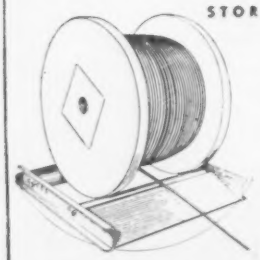

Style A: 2,000 lbs. cap. 37.50

Style B: 4,000 lbs. cap. 75.00

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ADDED STRENGTH
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COLLAR SECTION cannot pull out because prefabricated from drawn seamless copper tubing.

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● JAMES A. BULLOCK, general manager of the Western Colorado Power Co. since May of 1937, was promoted to vice-president on Nov. 20. Bullock began his utility career in 1909 with the old Telluride Power Co. in Utah, later being transferred to Telluride properties in Colorado where he played an important role in the pioneering development of alternating current in the Savage Basin-Telluride district. Later he entered Brigham Young University in Provo, Utah, returning to the Utah Power & Light sales staff. In 1930 he was advanced to division manager for Logan and later at Preston, Idaho. In 1937 he was named general manager of Western Colorado Power with headquarters at Montrose. Bullock is president of the Rocky Mountain Electric League.

● CHANGES of personnel have been announced by the Colorado Central Power Co. FRANCIS K. GODWIN, vice-president, has left the company to accept an executive position with East Coast Public Service Co. at Wilmington, Del. To fill the vacancy created by Godwin, the power company has appointed J. ERNEST WILSON and LEE R. JONES as vice-presidents. EARL G. ARMSTRONG, treasurer of the company for the past three years, was appointed as a director to serve the unexpired term of Godwin.

● LOS ANGELES Department of Water & Power recently promoted four of its employees. BRADLEY COZZENS has been named executive assistant to Samuel B. Morris, general manager. THEODORE M. BLAKESLEE was advanced to the position of engineer of transmission and communications, operating division. ARTHUR L. WILLIAMS has been appointed engineer of distribution and transmission design. JOSEPH F. MARISCAL is engineer of construction.

● JOSEPH S. THOMPSON, president of Pacific Electric Mfg. Corp., San Francisco, recently received a gold certificate from the National Electrical Manufacturers' Assn. in recognition of 50 years or more of continuous service to the electrical industry. The presentations were made to five members of NEMA at the association's 21st annual meeting in Atlantic City last month.

● CLARENCE H. HOPER has been named city manager for Colorado Springs, Colo., following the resignation of Earl L. Mosley. For the past several months Hoper has been with the Bureau of Reclamation in Denver. A former electrical engineer with Public Service Co. of Colorado, he served as city manager of Alliance, Nebr., from 1936 until January of this year.

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CABLE FEEDERS

Speed up the feeding of cable from the reel into the conduit. The heavy flexible tubing prevents injury to the cable and the large mouth facilitates the application of pulling compound

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Deaths

Ezra F. Scattergood

Ezra F. Scattergood, 76, internationally known electrical engineer, died Nov. 15 after a 10-day illness resulting from a heart condition.

Mr. Scattergood went to Los Angeles in 1902 and until 1906 was the city's consulting electrical engineer. During the next three years he was a special engineer for the Huntington Light, Power & Electric Co. in Los Angeles. When the Los Angeles Bureau of Power & Light was organized in 1909, he became its chief electrical engineer and general manager and retained these posts until 1940 when he retired from active service and became the consulting engineer for the bureau.

During Mr. Scattergood's period of service, the transmission line from Boulder Dam was built by the Department of W ter & Power. He was one of the most staunch proponents of municipal ownership of public utilities.

He was a member of the Public Works Advisory Committee for California under the NRA in 1933; advisory engineer to the President's National Power Policy Committee on Preparedness, 1939-40; member of the Colorado River Board of California, from 1938; president of American Public Power Assn. this year, and chairman of the Committee on Electric Power of California State War Council.

Phillips B. Shaw

Phillips B. Shaw, 52-year old president of the Arizona Edison Co., died in a Phoenix, Ariz., hospital Nov. 10 after a long illness.

He had been prominent in the utility field since 1920, shortly after his discharge from the army following World War I, when he joined the National Electric Power Co. as a vice-president. He was elected president of Arizona Edison in 1937.

Mr. Shaw was born in New York, Jan. 14, 1895, attended New York public schools and was graduated from Williams College, Williamstown, Mass., in 1916. He was attending law school at Columbia University when he joined the Army in 1917.

He moved from vice-president of the National Electric Power Co. to the position of vice-president and director in 1923 and became its director in 1925. Four years later he was named president of North American Gas & Electric Co., a position he held until he was chosen to head Arizona Edison. At the same time he was named managing director of the Ohio Service Holding Corp. and its subsidiaries, a position he relinquished in 1943.

MERCURY SWITCHES

are used in all Mercoid Controls. They assure better control performance and longer control life. That is why Mercoid Controls rate a very high percentage of customer satisfaction -a good reason for specifying-

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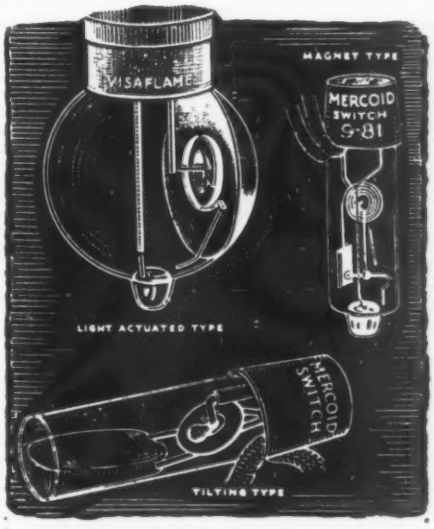

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Mercoid switches are available to the trade in various designs, sizes and capacities.

There are numerous applications where these switches have a definite advantage over the open contact type switches.

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FOR HEATING, AIR CONDITIONING, REFRIGERATION AND VARIOUS INDUSTRIAL APPLICATIONS

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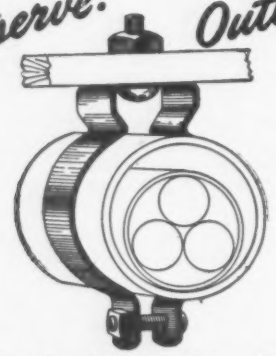
Steel HANGERS, CLIPS, STRAPS
Outserve! Outlast!



Minerallac Cable, Conduit and Messenger Hangers are STEEL. Easier, quicker to install; permit speedy, compact wiring; economical. Also in Everdur . . . Porcelain insulating Bushings available.

Jiffy STEEL Clips (Pipe-clamp) require only one screw, nail or bolt; rib-strengthened; for hanging pipe, conduit, BX cable, mounting coils, etc. Millions in use.

Steel Straps for Messenger-cable services on outlet boxes; may be used in conjunction with hangers.

Order from your Electrical Wholesaler. Send for literature.

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LIGHTING MAN WANTED

Quality Lighting Equipment manufacturer with a 40-year national reputation, is seeking an aggressive lighting man for the Los Angeles territory. This is an excellent opportunity for the man who qualifies. Please send complete details of experience and background to Box 239, Electrical West, 68 Post St., San Francisco 4, Calif.

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Twenty-seven years' experience in utilities administration and operation, including 7 years as general manager of hydro and diesel system. Now employed in industry, but wants administrative position in medium or small electric utility. Desire permanency and stability. Write Box 240, Electrical West, 68 Post St., San Francisco 4, Calif.

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NOTES ON THE TRADE

● WESTINGHOUSE ELECTRIC Corp. has opened its new quarters at 410 Bush St., San Francisco. The new building provides 40,000 sq. ft. of space and answers the need for consolidatation of personnel in one location, according to Charles A. Dostal, vice-president. The two branches of the company not affected by the move are Westinghouse Electric Appliance division at the Western Merchandise Mart, 1355 Market St., San Francisco, and the Westinghouse Electric Supply Co., which recently moved to its new location at 201 Potrero St., San Francisco. The three-story Bush St. Building was completely redesigned and modernized. Interior of the store provides spacious offices and general work areas. The entrance lobby displays smaller Westinghouse products.

● QUINCY BENT recently retired as vice-president in charge of steel division operations, Bethlehem Steel Co. He will continue as vice-president in an advisory and consulting capacity and as a director of the company until the end of this year. S. J. CORT, general manager of the company's Sparrow Point, Maryland, plant succeeds him.

● COLUMBIA STEEL Co. has advanced C. S. Conrad to the position of general manager of sales. Other sales executive appointments include: W. B. Sawyer Jr. as assistant general manager of sales administration; Eric Barnett, assistant general manager of sales distribution; C. L. Hamman, general sales staff manager.

● CALIFORNIA ULTRAVIOLET Co., at 420 Market, San Francisco, has been announced by Westinghouse Lamp Division as the engineering and sales outlet in northern California and Northwestern Nevada for Sterilamp. Albin Youngholm heads the organization.

● ROBERT E. EHORN, 9352½ Olympic Blvd., Beverly Hills, has started a consulting engineering service and will specialize in commercial installation of lighting. Ehorn is also a representative for Capital Lamps, Los Angeles distributor.

● GARLAND-AFFOLTER ENGINEERING Corp. has moved its offices to 58 Sutter St., Room 407, San Francisco 4.

James Seymour Moulton, executive engineer, Pacific Gas and Electric Co., whose biography appears on page 83

● FOWLER MFG. CO.'s new $100,000 building to increase the manufacture of electric water heaters, is now operating in full use according to its sales manager Fred A. Fowler, son of president Paul F. Fowler. The structure is located across the street from the main Fowler plant in Portland. Manufacture of electric water heaters by Fowler was consolidated in the city of Portland in May 1945.

● ROLPH D. STODDARD has been made advertising and sales promotion manager for California Electric Supply Co., San Francisco, northern and central California distributors of Crosley radios and appliances. He was formerly assistant in charge of audience promotion to Robert F. Laws, publicity manager for station KGO, San Francisco.

● THOMAS H. RYAN has been appointed West Coast regional manager for Presteline, according to A. Raysson, general sales manager of the domestic appliance division, Pressed Steel Car Co. Inc. He will handle all phases of distribution and merchandising of Presteline electric ranges on the coast, and will have headquarters in the San Francisco office of Pressed Steel Car Co.

● JOSLYN Co. of Calif. has consolidated with the Jobbers Supply Co. of Seattle under the new corporate name of Joslyn Pacific Co. The company will maintain sales offices and warehouses in San Francisco, Portland, and Seattle, with the general office and Western plant at Los Angeles. J. B. Naugle will serve as San Francisco district manager of the consolidated company.

Memo: To Electrical Manufacturers
And Their
Western Representatives

Re: Manufacturers' Directory,
Electrical West, April, 1948

Buyers of electrical equipment in the Western states use this Directory throughout the year. With your cooperation we hope to make this next issue (the 16th Annual edition) the most complete and useful yet. For the first time it will be published as a separate supplement to the April issue.

If you have not already filled out the questionnaire we have sent you requesting information about your Western sales outlets, won't you do so soon? We need this information to make the Directory accurate and up-to-date. We have more questionnaires if you've misplaced the first one or if we didn't send you one.

Thanks for your cooperation.

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Spokesman for the most highly electrified section of the U. S.

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Built-Up Mica Products for Every Electrical Insulating Use

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Cut and Uncut Mica for Electrical, Condenser and Electronic Applications

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electric or air actuated, will solve your signalling problems. Easily installed, these powerful, penetrating signals have a quick cut-off, may be coded to convey a variety of messages. Built to live in industrial locations, weather and water proof; heavy construction of corrosion proof metal insures long life, dependable operation.

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F. M. NICHOLAS COMPANY
1123 Harrison Street, San Francisco 3, California

White

● HENRY R. WHITE has been named southern California sales representative for Day-Brite Lighting Inc., St. Louis, Mo. He will have headquarters at the H. R. White Co., 912 E. Third St., Los Angeles, 13. A former buyer with Montgomery Ward, Chicago, White later joined Faraday Electric Corp. of Adrian, Mich., as Western district manager. He resigned in August 1947 to form his own manufacturers agency.

● VINCENT J. MCINTYRE, formerly of Bandoli-McIntyre Co., has organized the Utility Sales Co. which will serve as manufacturers' agents west of the Rocky Mountains, specializing in parts and accessories for electric refrigeration, both commercial and domestic. McIntyre, at one time national sales manager for Nash-Kelvinator Corp., and later vice-president in charge of distribution for Dictograph Products Inc., New York, organized the Bandoli-McIntyre Co. two years ago. He recently withdrew from active participation in that company to organize the Utility Sales.

● ELECTRIC PRODUCTS Co., Cleveland, Ohio, has established West Coast district offices at Portland, San Francisco, and Los Angeles. The Portland office at 342 Sherlock Bldg., is headed by William J. Cottrell. The San Francisco representative is Donald T. Elliott, with offices at 921 Howard St. In charge of the Los Angeles office at 1262 S. Boyle Ave., is H. D. Easterbrook.

● WARD LEONARD ELECTRIC Co., New York, has appointed W. R. L'Hommedieu, 722 E. Washington Blvd., Room 303, Los Angeles 21, as its new sales representative in the Los Angeles area.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, as Amended by the Acts of March 3, 1933, and July 2, 1946 of Electrical West, published monthly at Los Angeles, Calif., for October 1, 1947.

State of California } ss.
County of San Francisco }

Before me, a notary in and for the State and county aforesaid, personally appeared George C. Tenney, who having been duly sworn according to law deposes and says that he is the Editor of the Electrical West, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, McGraw-Hill Company of California.....68 Post St., San Francisco 4, Calif.
Editor, George C. Tenney.....68 Post St., San Francisco 4, Calif.
Managing Editor .....None
Business Manager.....Roy N. Phelan, 621 So. Hope St., Los Angeles 14, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member must be given.)

McGraw-Hill Co. of Calif., San Francisco; McGraw-Hill Publishing Co., Inc., New York; James H. McGraw, Jr., New York City; Curtis McGraw, New York City; George C. Tenney, San Francisco, Calif.; John W. Otterson, San Francisco, Calif.; N. A. Bowers, San Francisco, Calif.; Roy N. Phelan, Los Angeles, Calif.

3. That the known bond holders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is..... (This information is required from daily, weekly, semiweekly and triweekly newspapers only.)

GEORGE C. TENNEY, Editor.

Sworn to and subscribed before me this 3rd day of October, 1947.

(SEAL)

WM. E. SCHORD,
(My commission expires June 2, 1950.)

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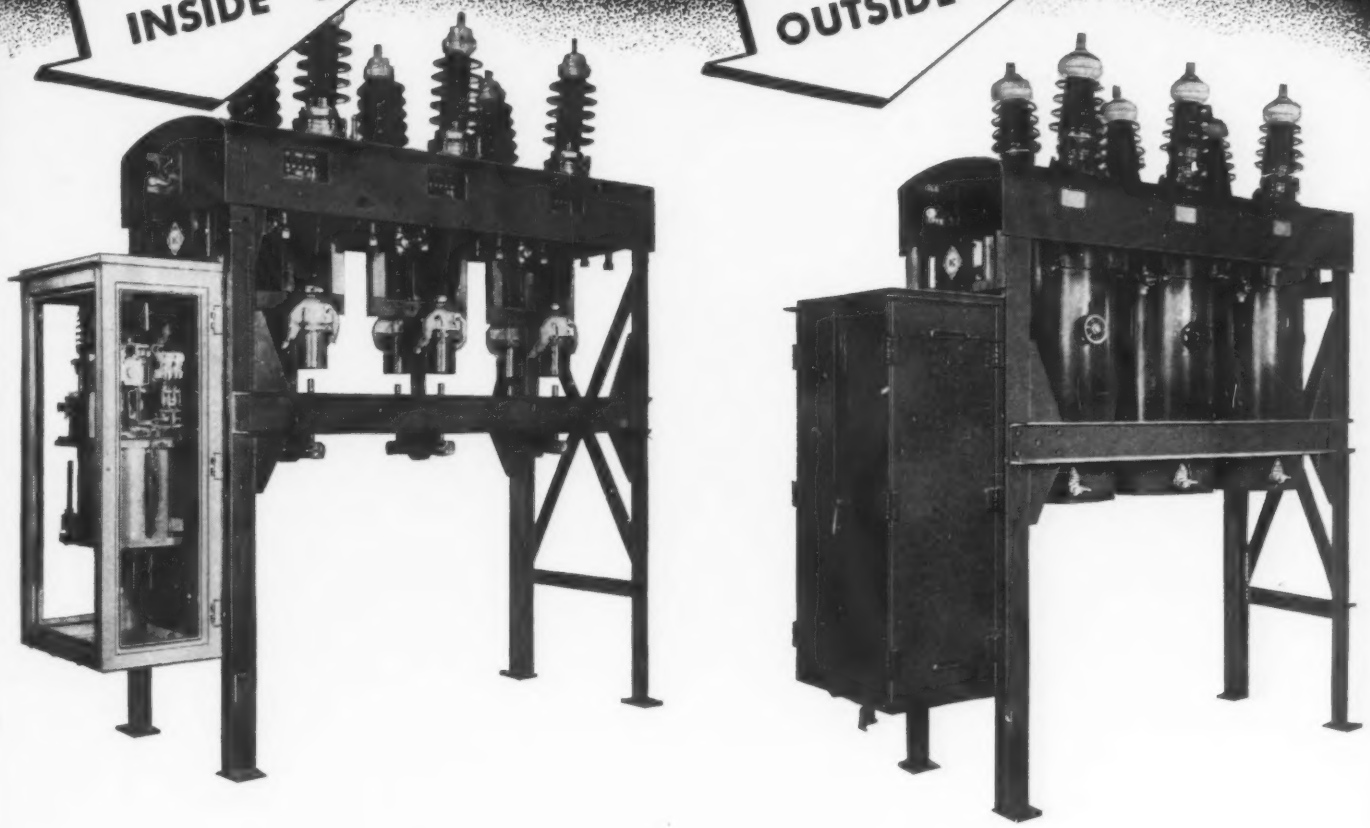

"UNITOP" Oil Circuit Breaker Has *One-Piece* Top Frame —*Sealed* Mechanisms —*Internal* Wiring —*Heavy* Steel Frame — For *Longer* Life, *Lower* Maintenance!

OUTSIDE—The smooth exterior of the Allis-Chalmers "Unitop" oil circuit breaker seals out snow, sleet, and rain. A one-piece, continuous heavy steel top frame covers all three poles. All wiring is carried in sealed ducts within the top frame eliminating crevices that collect dirt and water and invite corrosion. Heavy-gauge steel tanks are gasket-sealed to top frame and designed with wide bases for protection against spilling accidents when tanks are lowered to the ground for maintenance checks.

INSIDE—Entirely enclosed mechanisms are built for long, trouble-free service. The Allis-Chalmers high-speed "Ruptor" interrupting device—two per pole—increases life of contacts and oil, and reduces tank pressures by high speed interruption of arc in its oil-filled pressure chamber.

Allis-Chalmers "Unitop" type FZO-150 frame mounted outdoor oil circuit breakers are supplied in ratings from 15 to 46 KV, standard sizes up to 2000 amperes, and with interrupting capacities from 500,000 to 1,500,000 Kva. They can be equipped with either a pneumatic or solenoid operator. Contact your nearby Allis-Chalmers office or write for bulletin 71B6421. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2275

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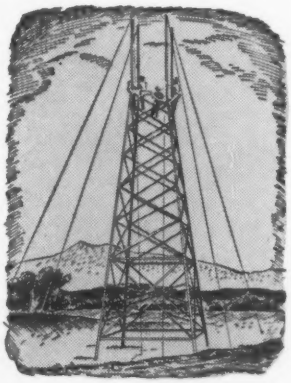
PROFILES

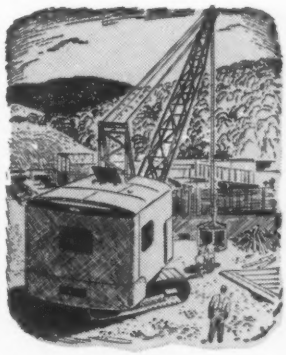
Shown, left, at the Northwest Electric Light & Power Assn. meeting with the dealer, contractor group are: John Taylor, B. C. Electric; Langtry Bell, Vancouver dealer; Ralph Lane, Seattle contractor. Story is on page 78

Below, commercial lighting men of Southern California Edison Co. at last month's IES meeting in Los Angeles included: (from left) Bob Ryan, Visalia; Jim Bethell, San Bernardino; Jack Schultz, Lancaster; G. M Rankin, Los Angeles, department head; C. A. Bedell, Montebello; R. R. Prince, Santa Barbara; J. W. Dickson, Santa Anna

When Walter Geist (right), president of Allis-Chalmers Mfg. Co., spoke to the San Francisco Electric Club about his company's long siege by radical unions, J. L. Singleton, vice-president and director of sales (left) and W. C. Johnson, executive secretary for the general machine division, were in town too for a Pacific Coast sales meeting and on a tour of all Western offices of the company



MEN at WORK all along the line!



Thousands of men are at work on scores of projects throughout Northern and Central California in this company's $350,000,000 expansion program to meet the future needs of this area for electricity and gas.

Some of the major projects in this construction program are:

KERN STEAM PLANT—A new $25,620,000 steam-operated powerhouse near Bakersfield to generate 235,000 horsepower of electricity.

MIDWAY SUBSTATION — A $10,300,000 project, including a 212-mile transmission line and a switching station to bring 220,000-volt power from Sierra hydroelectric plants to the Southern San Joaquin Valley.

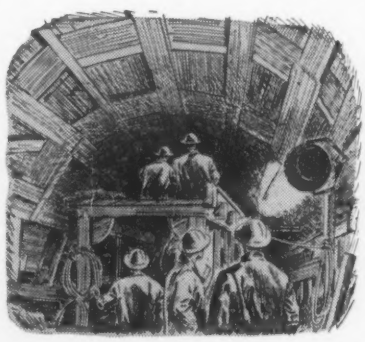
MORAGA SUBSTATION—A $7,200,000 substation and transmission line project to bring 250,000 additional horsepower of electricity to the power pool serving Contra Costa and Alameda Counties.

MISSION STATION—A new $6,400,000 substation and two transmission circuits to augment the power supply of the San Francisco metropolitan area.

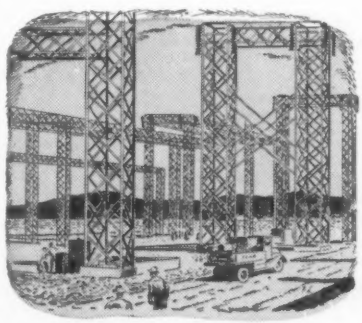
STATION "P" STEAM PLANT, SAN FRANCISCO—A $23,700,000 project that will increase the electric generating capacity of the present plant at Hunters Point from 62,000 horsepower to 360,000 horsepower.

ELECTRA AND WEST POINT POWERHOUSES — Two new powerhouses costing $19,600,000 with a combined generating capacity of 154,000 horsepower on the Mokelumne River.

ROCK CREEK AND CRESTA POWERHOUSES — Two new hydro plants on the North Fork of the Feather costing $61,800,000 and having a combined generating capacity of 270,000 horsepower.



This is the biggest construction job the P. G. and E. has ever undertaken and work is being accelerated as fast as materials and manufactured electric equipment are delivered. So far we are right on schedule to have the vast job done in 1951.



P·G·and E·

350 MILLION DOLLAR EXPANSION PROGRAM—1,000,000 ADDITIONAL ELECTRIC HORSEPOWER

EW 112-1247

Adventures in Radio Frequency Heating **PLYWOOD-RUBBER** (Last in a series of six advertisements)

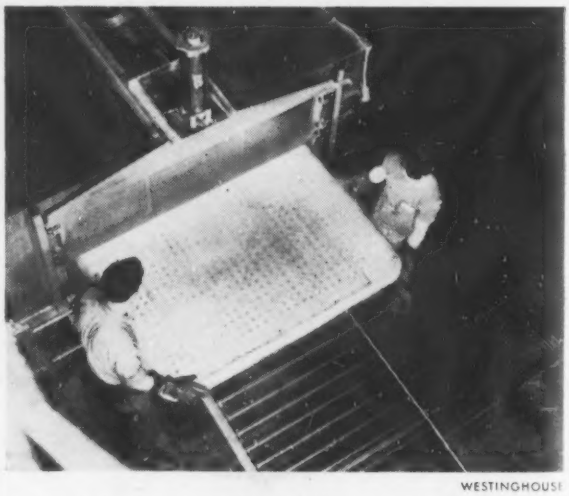
Wooden Sandwiches? Rubber Steaks?

WESTINGHOUSE

Press plates serve as electrodes as extremely thick blocks of plywood are glued together in a few minutes

When the dietitian becomes a *dielectrician,* sandwiches are made from layers of wood and huge ovens are built to "cook" rubber products, such as the mattress shown here. Dielectric heating is opening up new worlds in many industrial processes. Plywoods over a foot thick—148 layers—can now be bonded in an instant, because dielectric heat *penetrates* equally and evenly throughout. In the manufacture of rubber and latex products dielectric heat helps increase production while lowering unit cost by speeding up process time and improving quality.

Your local utility engineers are qualified to give you advice and suggestions regarding applications of this new, versatile heating tool of industry.



WESTINGHOUSE

In dielectric ovens foamed latex mattresses of 40 pounds dry weight are cured in 5 minutes instead of 30 minutes, previously required

PACIFIC COAST ELECTRICAL ASSOCIATION

447 Sutter Street, San Francisco 8 **601 West Fifth Street, Los Angeles 13**